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## ABSTRACT

The results of a study of the indexing provided by the "Bibliography of Agriculture" and 15 related secondary services are described. The data elements used with printed citations and the indexing features of each service are described and compared. A methodology was developed to compare the terms provided by the Bibliography and each other service for the same citations. The percentages of related and unrelated term pairs (one term used by the "Bibliography of Agriculture" compared with one term used by the other service) were given for services which use multiple term indexing and for those which use single term indexing. The number of subject access points per citation provided by each service for the same source material was also determined and compared. The unique subject access points contributed by the Bibliography and each other service were measured. Other comparisons were made between the index terms used by the other services and the "Bibliography of Agriculture" subject index, the index term words assigned to an article, the words in the title of the article, and the subject headings used by the "Bibliography of Agriculture" and other services for the same citations. (Author/SG)

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160

Report No. IGC-PA-69-40

June 1969

STUDY AND COMPARISON OF THE INDEXING OF THE  
BIBLIOGRAPHY OF AGRICULTURE IN RELATION TO THE  
INDEXING OF 15 OTHER SECONDARY SERVICES

Prepared by

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Jeanne B. North

Prepared for

National Agricultural Library  
Washington, D.C.

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<p>16. Abstract This report describes the results of a study of the indexing provided by the <u>Bibliography of Agriculture</u> and 15 related secondary services. The data elements used with printed citations and the indexing features of each service were described and compared.</p> <p>A methodology was developed to compare the terms provided by <u>B of A</u> and each other service for the same citations. The percentages of related and unrelated term pairs (one term used by <u>B of A</u> compared with one term used by the other service) were given for services which use multiple term indexing and for those which use single term indexing. The number of subject access points per citation provided by each service for the same source material was also determined and compared. The unique subject access points contributed by <u>B of A</u> and each other service were measured. Other comparisons were made between the index terms used by the other services and the <u>B of A</u> subject index, the index term words assigned by <u>B of A</u> to an article and the words in the title of the article, and the subject headings used by <u>B of A</u> and other services for the same citations.</p>			
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## I. INTRODUCTION

This indexing study was part of a more general study of the relationship of the Bibliography of Agriculture (B of A) to fifteen other secondary services. Reports were prepared earlier on the coverage and overlap studies of this effort.\*

The objective of this indexing study was to determine the relationship of B of A indexing to the indexing performed by 15 other services with agricultural R&D interests. The study was done by a review of data about these services, as well as a comparative study of the indexing done by each of the services for a common body of citations.

The National Agricultural Library staff specified the following secondary services to be studied with regard to their relationship to B of A:

- Biological Abstracts (BA)
- Biological & Agricultural Index (BAI)
- Chemical Abstracts (CA)
- Dairy Science Abstracts (DSA)
- Engineering Index (EI)
- Forestry Abstracts (FA)
- Horticultural Abstracts (HA)
- Index Medicus (IM)
- Index Veterinarius (IV)
- Meteorological & Geostrophysical Abstracts (MGA)
- Pesticides Documentation Bulletin (PDB)
- Public Affairs Information Service (PAIS)
- Textile Technology Digest (TTD)
- Tobacco Abstracts (TA)
- World Agricultural Economics & Rural Sociology Abstracts (WAERSA)

All of the above services, with the exception of BAI, IM, PDB, and PAIS, provide abstracts in addition to a citation. This group of services was intended to represent a cross-section of services that had a relationship to agriculture. These services are represented throughout this report by the abbreviations noted above.

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\*Bourne, Charles P. Characteristics of Coverage by the Bibliography of Agriculture of the Literature Relating to Agricultural Research and Development. Report No. IGC-PA-69-38. 1 June 1969.

Bourne, Charles P. Overlapping Coverage of Bibliography of Agriculture by 15 Other Secondary Services. Report No. IGC-PA-69-39. 1 June 1969.

## II. MAJOR CHARACTERISTICS OF THE SERVICES STUDIED

### A. GENERAL

Some of the general characteristics (e.g., publisher, estimated circulation) of the services studied are listed in summary form in Table I. All of the services are English-language, and all are published in the United States or England. Several of the services such as IV and WAERSA are more directly related to agriculture than others such as CA and BA. Published reports of the operating practices and procedures of several of these services are cited in the bibliography at the end of this section. For this report, particular attention was given to finding reports that discussed the indexing practices of those services.

In indexing, a useful distinction can be made between access points which can be extracted from the data elements in the citation and those which are added from examination of the full publications cited. Access points such as author, corporate author, patent or report number, when present in the citation can be pulled out easily for indexing. In general, subject indexes, including corporate names as subjects and geographic location indexes must be prepared from the full text. Keyword-in-title indexes are an exception in that they provide some subject access using only the citation. It is also true that author and corporate author indexes compiled from the citations may serve sometimes as subject approaches. However, as a general principle it is subject access which is not implicit in the transcription of the citation, and which requires intellectual as contrasted with clerical effort. Therefore in considering the indexing provided by the various services the subject and non-subject features have been distinguished.

Figures 1 and 2 show full size, typical entries in the printed author and subject indexes, respectively, of these services. This presentation shows the great variety in size and style of typography used by the various services. Many use all capitals, which is a consequence of computer production but is more difficult to read. In addition, this kind of printout is often photo-reduced, making it even less legible. There is also variation in the content of the indexes, e.g., brief citation, full citation, or reference number only. The full page format of each service could not be shown here, but this too would indicate further visual variety. More specific characteristics of the indexing practices of each of the services are described in the following sections.

<u>Service</u>	<u>Publisher</u>	<u>Type of Publisher*</u>	<u>Country</u>	<u>Frequency of Publication</u>	<u>Estimated Circulation</u>	<u>Annual Subscription Cost for U. S. Subscribers</u>	<u>Total Number of Items Covered in 1967</u>	
							<u>References</u>	<u>Abstracts</u>
Bibliography of Agriculture	National Agricultural Library	G	U.S.A.	Monthly, except no December announcement issue	2,500	\$26.50	94,238	--
Biological Abstracts	Biosciences Information Service of Biological Abstracts	N	U.S.A.	Semi-Monthly		\$800, \$640 non-profit and indiv.	--	125,026
Biological and Agricultural Index	H. W. Wilson Co.	C	U.S.A.	Monthly, except Sept.	943	\$35.00	40,000 est.	--
Chemical Abstracts	Chemical Abstracts Service	N	U.S.A.	Weekly, except June when an additional issue is published June 30	6,660	\$1550, but \$500 grant awarded to eligible educational institu- tions	--	240,000
Dairy Science Abstracts	Commonwealth Bureau of Dairy Science & Technology	G	Gt. Britain	Monthly	2,000	\$31.50	--	4,872
Engineering Index	Engineering Index, Inc.	N	U.S.A.	Monthly		\$450.00	--	56,560
Forestry Abstracts	Commonwealth Forestry Bureau	G	Gt. Britain	Quarterly	1,400	\$31.50	--	6,736
Horticultural Abstracts	Commonwealth Bureau of Horticulture & Plantation Crops	G	Gt. Britain	Quarterly	1,900	\$36.00	--	8,045

Table I

General Characteristics of Selected Secondary Services Related to Agricultural R&amp;D

<u>Service</u>	<u>Publisher</u>	<u>Type of Publisher*</u>	<u>Country</u>	<u>Frequency of Publication</u>	<u>Estimated Circulation</u>	<u>Annual Subscription Cost for U. S. Subscribers</u>	<u>Total Number of Items Covered in 1967</u>	
							<u>References</u>	<u>Abstracts</u>
Index Medicus	National Library of Medicine	G	U.S.A.	Monthly	5,977	\$63 (\$72.25 for annual cumulation)	168,310 FY67	--
Index Veterinarius	Commonwealth Bureau of Animal Health	G	Gt. Britain	Quarterly		\$45.00		--
Meteorological and Geostrophical Abstracts	American Meteorological Society	N	U.S.A.	Monthly		\$400 for Gov't agencies & industrial, commercial, scientific & research organizations; \$200 educational institutions & public libraries; \$30 individual AMS members; \$40 individual non-AMS members	--	8,998
Pesticides Documentation Bulletin	National Agricultural Library	G	U.S.A.	Bi-weekly		\$14.00	27,327	--
Public Affairs Information Service Bulletin	Public Affairs Information Service, Inc.	N	U.S.A.	Weekly		\$100.00		--
Textile Technology Digest	Institute of Textile Technology	N	U.S.A.	Monthly	950	\$50.00	--	10,976
Tobacco Abstracts	Tobacco Literature Service D.H.Hill Library, No. Carolina State Univ.	N	U.S.A.	Monthly, except no Dec. announcement issue	850	\$7.00	--	2,966
World Agricultural Economics and Rural Sociology Abstracts	Commonwealth Bureau of Agricultural Economics	G	Gt. Britain	Quarterly	900	\$22.50	--	4,455

\* G = Government, N = Non-profit, C = Commercial

Table I (Concluded)

General Characteristics of Selected Secondary Services Related to Agricultural R&D

And Eli-Salam, M. H., 319, 320  
 Andolina, L., 13  
 A. A. in *endure*, 382  
 Adams, C. E., 194  
 Aides, J., 309  
 Akhmetova, Sh. I., 271  
 Akhundov, K. R., 321  
 Aisic, C., 281  
 Albright, J. L., 60  
 Alderlieste, P. J., 112  
 Alejo, L. G., 301  
 Aleksiejczyk (Aleksiejczyk),  
     Z., 208  
 Allim, K. A., 147  
 Ambie, V. N., 7  
 Anderson, J. A., 174  
 Annibaldi, S., 238  
 Araujo, O., 12  
 Arima, S., 244  
 Arisanu, I., 212  
 Armstrong, J. McD., 283, 285  
 Ashworth, U. S., 263  
 Asouda, H., 309  
 Paula Assis, F. de, 52  
 Aune, K. C., 292

**IM**  
**Monthly Issue**

IV  
Early Issue

Albrecht JI see Gersmeyer EF  
Albrecht JI, Kohnen G. Banded tick-borne encephalitis virus by the fluorescent antibody technique. Bull WHO 36:Suppl 1:85-9, 1967  
Albrecht P see Miesowicz M  
Albrecht CD see Post RL  
Albright JD see Fette RD  
Albana I see Tama L  
Albuquerque EX, Teskeff S. Influence of phospholipase C on some electrical properties of skeletal muscle membranes. J Physiol (London) 211:25-37, May 67  
Alderman HG, Fenchel RL. Hypertension induced by Naushin (Caldor) in diabetic rats. in rats. Nature (London) 215:141-4, 4 Feb 67  
Alderman J, Christensen GR. Personality correlates of male aging. Nurs Res 13:375-4, Fall 67  
Alderman RB. The prince and prophet. J Med Asso Georgia 55:151-6, Apr 66  
Alder VG, Brown AM, Mitchell RG. The tollhrite reactions of conjugal negative staphylococci and micrococci. J Appl Bact 25:394-7, Aug 66  
Alderfer MW see Martin TG  
Alderman RW. A comparative study on the effectiveness of two trips for teaching beginning golf. Res Quart Amer Asso Health Phys Educ 36:3-9, Mar 67  
Alderson ME. Data on sickness absences in some recent publications of the Ministry of Pensions and National Insurance. Brit J Prev Soc Med 21:1-4, Jan 67  
Alderson MR, Meade J. Accuracy of adjudicated death certificates compared with this in hospital records. Brit J Prev Soc Med 21:123-9, Jan 67  
Al-Deery Y see Khaber SS

**FUSIÓN PRODUCTS** see *Radiations, general*  
**FITCH, C.D.** see *Nicholside, G.E.*  
**FITZKE, J.** see *Eberstadt, H.J.*  
**FITZGERGE, R.** see *Seamer, J.*  
**FITZGEORGE, R.B., SOLOTOROVSKY, M. & SMITH, H.**  
 (1967) The behaviour of *Brucella abortus* within macrophages separated from the blood of normal and immune cattle by adherence to glass. - *Br.J.exp.Path.* 48: 522-528 + 1 plate  
**FITZGERALD, T.C.** see *Hovew, J.R.*  
**FITZGERALDS, W.M., SANSOM, B.F., HALL, J.G., STEWART, J.S.S., SELWICK, S.A. & HARNESSE, E.**  
 (1967) Blood transfusion and red cell survival in dysgotic cattle twins. - *Br.vet.J.* 123: 397-402 [*s.g.ap.*]  
**FITZWATER, J.J.** see *Magee, A.R.*  
**FDCA, B.** see *Langr, F.*  
**FJELLSTRÖM, D.** see *Kilström, J.E.*  
**FLACK, M.B.** see *Blenkinsopp, W.K.*  
**FLASHMAN, A.** see *Johnston, D.E.*  
**FLATLA, J.L. & ENDER, F.** (1967) Industrial fluorosis in cattle in Norway. - *Proc. IVth Int. Meet. Wild Ass. Bulartrics, Zürich 1966* pp. 45-58 [*E.i.g.*]  
**FLAHS**  
 The fleas (*Siphonaptera*) of Egypt. An illustrated and annotated key. - *Lewis, R.E.* (1967) *J. Parasit.* 53, 663-665

**Fig. 1**  
**Typical Examples of Author Indexes of Each Service**

Aarous, J., 564  
 Ababarel, S., 214  
 Abbe, M. A., 563  
 Abraham, F., 220  
 Adam, A., 504  
 Adams, G. W., 420  
 Adem, J., 394  
 Adriaan, Tu., 159  
 Afanas'ev, A. N., 13  
 Aiken, A. C., 22  
 Aizenshat, R. A., 232, 265  
 Akademiia Nauk SSSR, Inst.  
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 Alfven, H., 528  
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 Allan, R. R., 191  
 Allen, H. J., 600  
 Allen, R. S., 564  
 Allum, F. R., 520  
 Allwood, R. J., 512  
 Almarov, A. M., 740  
 Anap'oi'skaia, L. F., 379  
 Anderson, A. D., 594

Davis, G R P	13031
Davis, R E	13564
DeLoes, K	13538
Dayson, P S	13032
Day, W H	13506
Dean, H A	13005
Defner, J	13506
DeKruif, R	13223
DeKruif, R H	13225
DeNyck, D	13501
Deoat, P J	13501
Desay, D	13612
Descamps, H	12946
Detlier, V C	13033
Diamond, A	13225
Diamond, J	13253
Dixon, I	13517
Dixon, J M	13134
Dlugosheka, T	13058
Dogra, G S	13058
Doherty, J D	13578
Dohring, R	13661
Doolittle, R R	13637
Doonan, D	13493
Dorfman, Z	13681
Dorrough, H	13535
Dorake, C A	13613
Dorokina, V H	13301
Dorudzinski, A	13126
Duffy, T B	13510
Duggan, R R	13538
Duke, R J	13036
Dunham, C L	13505
Durban, J E	13614

Adams, E E  
U.S. Department of Agriculture, Beltsville  
Agricultural Research Service  
Crop Research Division  
Beltsville, Maryland  
U.A.R. Ministry of Scientific Research, Cairo  
Agricultural Research Centre  
Biological Control Unit  
Ain Helwan, Egypt  
World Health Organization, Geneva  
Ahrens, W  
Campbell Institute for Food Research, Canada, M.J.-  
Asses, B A  
U.A.R. Faculty of Agriculture, Dokki  
Plant Protection Department  
Cairo, Egypt  
U.A.R. Ministry of Agriculture, Dokki  
Stored Products Pest Investigations  
Department  
Cairo, Egypt  
University of California, Berkeley  
Bancroft, J F  
Purdue University, Lafayette, Indiana  
Bancroft, J B  
Department of Food and Plant Pathology  
Purdue Agricultural Experiment Station, Lafayette, Inc.  
Barzi, B  
Institute Agraria Accademia Montecitorio, Milan, Italy  
Beloff, G E  
American Scientific Laboratories  
Cincinnati, Ohio  
Nuclear Science and Engineering Corporation, Pittsburgh

**TTD**  
**Monthly Issue**

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Fleischer GmbH, 5140, 5161  
Fleissman, L. 5047  
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Fortena, P. 5345  
Forster, W. 50219  
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Frost, B. 5051, 5066, 5025  
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Fry, J. 5218  
Frieder, L. P. 51273  
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Ltd. 5285  
Fuji Spinning Co. Ltd. 51050, 5103  
Pajot

TA	Monthly Issue
Chortyk, O. T.	2941
Clarke, A. J.	2797
Clarke, P. H.	2800
Colloms, M.	2807
Commoner, B.	2826
Concannon, J. P.	2802
Connecticut Agricultural Experiment Station.	2758, 2857
Consolidated Cigar Corp.	2873
Cook, C. E.	2734
Cook, M. K.	2874
Cox, P. M.	2797
Cronshaw, J.	2806
Curran, J. G.	2735
Dalton, J. O.	2903

WAERSA	Monthly Issue
Cain, R. L.	864
Čalkovský, S.	388
Canamile, G. H.	997
Canasato, I.	885
Canada: Canadian Agricultural Economic Society	582
Department of Agriculture and Food	187
Capel, R. E.	322
Carpenter, E. M.	404
Carter, H. O.	953
Casey, H.	943
Cassell, G. R.	241
Cekov, A.	735
Cépède, M.	845
Cerenuškin, S.	416
Cernohous, Z.	263
Černokolev, T.	125
Cřasman, J. M.	453
Chalmers, A. M.	671
Chapman, H. S.	405
Chataigner, J.	278
Chattopadhyay, S. N.	857
Chaturvedi, R. N.	250

**Fig. 1 (concluded)**

### Typical Examples of Author Indexes of Each Service





0	1	2	3	4	5	6	7	8	9
AERO-SPACE AND UNDERWATER BIOLOGICAL EFFECTS									
AERO-SPACE AND UNDERWATER - BIOLOGICAL EFFECTS- GENERAL METHODS									
	612	623							
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- ACCESSORY boring organ**  
Enzymes of the accessory boring organ of the mirid *Rastropus* and related genera (Hymenoptera: Miridae) and others. *Biol J Linn Soc* 133:101-10 (1967)
- ACCIDENT prevention.** See Safety devices and measures
- ACCIDENTS**  
See also Safety education
- ACCLIMATIZATION**  
See also Animals; Effect of temperature on
- ACCLIMATIZATION (plants)**  
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- ACCOUNTING**  
See also Bookkeeping
- ACCOUNTING, Household.** See Budget, Household
- ACER saccharum.** See Maple--Sugar maple
- ACERACEAE**  
Study of forty-seven species and blade tissue of *aceraceae*. H. O. Powers. *Biol J Linn Soc* 78:301-23 (1967)
- ACETABULARIA crenulata**  
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- 2-ACETAMIDO-2-DEOXY-D-GLUCOSE 6-phosphate amido-hydrolase.** See Acetylglucosamine 6-phosphate deacetylase
- 4-ACETAMIDO-2-ETHOXYBENZOATE.** See Ethopabate
- ACETANILIDE**  
Microbial conversion of acetanilide to 2'-hydroxyacetanilide and 4'-hydroxyacetanilide. R. J. Theriault and T. H. Longfield. *Biol J Linn Soc* 133:135-5 (1967)
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- Relative significance of acetate and glucose as precursors for lipid synthesis in liver and adipose tissue from ruminants.** R. W. Hanson and F. J. Ballard. *Biol J Linn Soc* 133:329-36 (1967)
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- Chem 44:611-19 (1967)**
- ACETOGLYCERIDES.** See Glycerides
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Neue Sonnenschutzgläser zur Verglasung von Gebäuden und Fahrzeugen. H. SCHROEDER. *Holzang. Lufteing. Haustechnik* v 19 n 2 Feb 1968 p 37-41. New sunshade glass for glazing of buildings and vehicles; it is shown how cooling load of air conditioning plants can be reduced through laminated glass panes; development of glass which has on surface laminations with intensified reflection degree; metallic, dielectric and semiconductor laminations are exemplified with regard to their spectral transmission and reflective attributes as well as their applicability for versatile glazing. 11 refs. In German.

#### Office Buildings

Variable Volume System Coupled with Air Floor in Office Building Design. R.P. BREHM. *Heating, Piping & Air Conditioning* v 40 n 4 Apr 1968 p 87-92. It is shown how flexibility requirements were met through integration of building services in new 16 story office building constructed by Ralston Purina Co at St. Louis, Mo; for lower level of building packaged type air handling units supply air to strip diffusers mounted in ceiling; for office portion of building four central station air handling systems located in equipment rooms on third level above ground, supply 45,000 cfm each to interior areas; each system includes return/exhaust fan, pre- and final filters, sprayed coil dehumidifier, and high pressure supply fan; induction unit system provides 100% outside primary air to peripheral zones.

#### Vibrations

Structural Design of Air-Moving Systems. J.P. CONNIFF. *ASHRAE J* v 10 n 5 May 1968 p 77-81. Article reviews sources of vibration most frequently found in air-moving systems, presents basic design precepts to avoid most vibration problems, and describes testing procedures; resonant vibrations in operating environment and driving forces and their frequencies are discussed; method of observing vibration with stroboscope; techniques for measurement of vibration with accelerometers and with strain gages.

AIR ENTRAPMENT. See Concrete—Air Entrainment.

#### AIR FILTERS

Cost and Performance of Filtration and Separation Equipment—Air Filters. D.A. BENNELL. *Filtration & Separation* v 5 n 2 Mar-Apr 1968 p 150-5, 176. Operating principles of major types of air filters are described and methods of testing their performance are outlined; each type of filter is reviewed in terms of efficiency, initial cost, maintenance, electric current costs and resistance to air flow, and their advantages and disadvantages are summarized; operating costs of air filters based on 20,000 cfm units are given in table form.

AIR NAVIGATION. See Radar—Accessories.

#### AIR POLLUTION

See also Aerosols; Automobile Engines—Exhaust Gases; Boiler Firing—Oil; Carbon Black; Electric Insulators—Testing; Flue Gases; Odor Control; Smoke Abatement; Steel Corrosion; Wire Mills—Fume Control.

Air Pollution Control Equipment. L.C. HARDISON. *Petro/Chem Engr* v 40 n 3 Mar 1968 p 30, 32-3, 26, 36. Discussion on major air contaminants in United States—sulfur oxides, carbon monoxide, hydrocarbons, particulates, and others with emphasis on control regulations; each of contaminant is considered as to its importance to refiners; emissions of particulates from catalytic cracking

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# IM Monthly Issue

## ACTINOMYCOSIS (CI)

Allergic alveolitis. *Brit Med J* 3:691-2, 16 Sep 67  
Intranasal gastric actinomycosis. Urdaneta LF, et al. *Surgery* 62:431-5, Sep 67  
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## DIAGNOSIS

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## DRUG THERAPY

Chemotherapy of epidermal infection with *Dermatophilus congolensis*. Roberts DS. *J Comp Path* 77:129-36, Apr 67

## METABOLISM

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## VETERINARY

X-ray diffraction and infrared study of the 'sulphur granules' of *Actinomyces bovis*. Frazier PD, et al. *J Gen Microbiol* 46:445-50, Mar 67  
Dermatophitosis—an emerging disease in New Zealand. Smith JM, et al. *New Zeal Vet J* 15:98-9, May 67  
Mycotic dermatitis in sheep. I. Clinical observations in Great Britain. Hart CB. *Vet Rec* 81:36-47, 8 Jul 67

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## PATHOLOGY

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Activation analysis of mono- and dinucleotides. Rushley GW, et al. *Anal Biochem* 20:181-91, Jul 67  
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Instrumental radioactivation analysis of selenium in biological materials. Dickson RC, et al. *Int J Appl Radiat* 18:153-9, Mar 67  
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# IV

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## FLUOROACETATE

Separation, identification and determination of the acetamide residues in water, biological materials and soils. II. Identification and determination by gas-liquid chromatography. - Sawyer, R., Cox, B. G., Dixon, E. J., & Thomson, J. (1967) *J. Sci. Food Agric.* 18, 287-289

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Pulmonary vasoconstriction in asphyxia during cross-circulation between twin foetal lambs. - Campbell, A. G. M., Cockburn, F., Dawes, G. S. & Milligan, J. E. (1967) *J. Physiol., Lond.* 192, 111-121

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FOLKERS, C. & KUIL, H. (1967) Blood-parasites in cattle, sheep and goats in Northern Nigeria. - *Bull. epizoot. Dis. Afr.* 15, 121-123 [E. f.]

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ABANDONMENT of automobiles  
The problem of abandoned vehicles (in various countries). Stephen W. Hurlbut. II  
Legal Govt Throughout World 6:23-7 Nr/MY 66  
† United States. Bus. and defense services  
Abandonment of automobiles in U.S. urban areas: nature and extent of the problem, and adequacy of present methods of handling it. Gardner F. Herrickson. Mr 67 IV-45IP II Tables map p 35c—Supt. docs  
ABANDONMENT of railroad routes. See Railroads—Abandonment  
ABBREVIATIONS  
The ABCs of Wall Street: shortened corporate titles adopted by many companies often mystify investors. Includes list of abbreviations which have adopted alphabet names in the past 5 years. Investor's Reader 47:10-16 Ag 24 '66  
† Wilkes, Ian, comp. British initials and abbreviations. 2d rev & enl ed '66 125-4 13NP 435—Hill, Leonard; 39—Burns & MacEachern LC 66-4534  
ABDUCTION  
Abductions effected outside national territory (examines two aspects of international law that are involved: violation of territorial sovereignty and rights of the individual who has received asylum). Daniel Marchant. Internat Comm Jurists J 7:243-68 Winter '66  
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Creative ability  
Elmrichs, John R. High-talent personnel: managing a critical resource. '66 288p bibls tables charts 39—Am. mgmt. assn. LC 66-20876  
Management techniques for handling and development of talented and creative personnel.  
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An abortion clinic ethnography [social, psychological, economic and medical characteristics of a relatively costly abortion clinic in the California Central Valley]. J. H. Ball. Social Problems 15:223-301 Winter '67  
British policy on therapeutic abortion: report of the Royal medico-psychological association. June 1966. Am Med Assn J 189:109-200 Ja 16 '67  
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A humane stand on abortion [Roman Catholic viewpoint]. Conference on abortion. 1966. 67-72 Markham chart Catholic Chrities R 61:46 Ap '67

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 BURLEY 37 REGISTRATION  
 BURLEY 49 REGISTRATION  
 BURNING RATES CIGARETTES MEASUREMENT  
 BUTENYLIDENE-TRI-METHYL-CYCLOHEXENONE ADDITIVE  
 N-BUTYL-BENZENE TOBACCO VOLATILES  
 1,3-BUTYLENYLGLYCOL HUMECTANT FUNGICIDE  
 GAMMA-BUTYROLACTONE PYROLYSIS SUCROSE  
 BV 207 WEEFS CONTROL  
 2392  
 243  
 2433  
 2392  
 2391  
 2401  
 656  
 656  
 656  
 2178  
 656  
 656  
 1185  
 2178  
 656  
 2587  
 2750  
 467  
 2741  
 885  
 26  
 1512  
 1766  
 1767  
 2138  
 932  
 2373  
 2191  
 2508  
 1927  
 2573  
 898  
 900  
 598  
 2573  
 342  
 2462  
 2475  
 2475  
 158  
 598  
 2132  
 355  
 530  
 2038  
 548  
 1461  
 424  
 2577  
 2589  
 2745  
 1745  
 CAFFEIC ACID  
 CALCIUM BORON RATIOS CHEMICAL COMPOSITION BIODI  
 CALCIUM CYANIDE WEEFS CONTROL  
 CALLUS CELL PROLIFERATION TISSUE CULTURE LEAF DISKS  
 CALLUS CELL RECOVERY TIV  
 CALLUS TISSUE CULTURES CHROMOSOME NUMBERS  
 CALLUS TISSUE CULTURES KINETIN EFFECT  
 CALLUS TISSUE CULTURES PHYTOSTEROLS  
 CALLUS TISSUE CULTURES THIAMINE KINETIN EFFECT  
 CALLUSES ASSAY SYSTEM PAPER CHROMATOGRAPHY  
 CALOMEL RHIZOCTONIA SOLANI CONTROL  
 CAMPESTEROL CALLUS TISSUE CULTURE  
 CAMPOLETIS PERDISTINCTUS  
 CAPSICUM ANNUM EXTRACTS PLANT VIRUS INHIBITOR  
 CAPSICUM ANNUM TOBACCO ETCH VIRUS  
 CAPSICUM ANNUM TIV RESISTANCE  
 CAPTAN RHIZOCTONIA SOLANI CONTROL  
 CARBAMATE HERBICIDES MODE OF ACTION  
 CARBAMATE INSECTICIDES HELIOTHIS CONTROL  
 N-CARBAMYLURESCINE NICOTINE FORMATION  
 CARBARYL RESISTANCE HELIOTHIS VIRESCENS  
 CARBOHYDRATE METABOLISM TOBACCO NECROSIS VIRUS EFFECT  
 CARBOHYDRATES MIXED CARBOINATES  
 CARBOHYDRATES THERMOPHILIC PLANTS  
 CARBOHYDRATES TOBACCO LEAVES DETERMINATION  
 CARBON DIOXIDE TOBACCO PLANTS  
 CARBON DIOXIDE FIXATION NICOTIANA TABACUM SANJUM CULTURE

WAERSA  
Quarterly Issue

Agricultural Sector  
 Programming 1  
 Allotments  
 Cotton  
 USA 718  
 Income Effects 717  
 Peanuts  
 USA 722  
 Tobacco  
 USA 726  
 Amalgamation, Farm  
 Belgium 440  
 Amortization  
 Production Co-operatives  
 Rumania 915  
 Analysis see under Specific Types  
 of Analysis  
 Analysis, Farm  
 Mathematical Methods 923  
 Ancillary Industries  
 Business Games 930  
 Processing  
 USSR 455  
 Ancillary Services  
 Co-operative Service Enterprises  
 Germany, East, 345, 594  
 Production Co-operatives  
 Rumania 626  
 Animal Housing see Livestock  
 Housing  
 Annual Review  
 UK 43, 44  
 Apples  
 Harvesting 522  
 Hungary 522  
 Production Methods  
 Switzerland 709  
 Area Analysis  
 Production Patterns  
 France 944  
 Area Development  
 Hill Farming  
 New Zealand (South Island)  
 113  
 Area Planning  
 France 383  
 Germany, West (Bavaria) 127  
 USSR 138, 139  
 UK 135  
 Farm Survey  
 Canada (British Columbia)  
 375

Fig. 2 (concluded)  
 Typical Examples of Subject Indexes of Each Service



## B. DATA ELEMENTS USED IN THE PRINTED CITATION

There is wide variation in the numbers and combinations of elements of data that are included in the printed citations of each service. Direct comparison is difficult because of differing coverage; for example, a service which covers only English language material has no option regarding inclusion of a translated title.

Thirty-eight elements were identified, of which B of A uses 25. Other services use from 13 to 32, with the average number being 23. Inclusion of first and second authors, title in full, volume number, inclusive paging, and year are the elements common to all services. Data elements used by more than half of the other services but not by B of A include corporate author location, cross-reference to related citation, and price. A third of the services, but not B of A, also include author affiliation and article title in original foreign language.

Use of the data elements, as determined by examination of printed citations, can be seen in Table II.

The data elements and characteristics of the bibliographic records in corresponding computer files of bibliographic data for several of these services have been identified and described separately in a report by the Auerbach Corporation.

## C. INDEXING AND ACCESS FEATURES PUBLISHED IN EACH ISSUE

### 1. Non-Subject Access

The non-subject access features provided in each printed issue by each of the services are summarized in Table III. Examples of author indexes for most of these services were given earlier in Fig. 1. Almost all services provided an author index with each issue, but few provided an author affiliation or address. More than half of the services provided access by corporate author, generally by including corporate authors in the author index. Organization names as subjects were given in subject indexes by some services. Only the two NAL publications provided separate organization indexes. Through 1967, B of A provided an Organization Index which included corporate names as authors or as subjects. Beginning in 1968, a separate corporate author index was provided, and organizations as subjects were included in the subject index. Beginning in late 1967, PDB provided a separate organization index covering corporate authors and sponsoring organizations.

None of the services provided a report number index, and only one service provided a patent number index. Nine of the services provided some indication of how copies of the cited materials could be obtained, usually by an introductory note announcing that copies could be obtained from a general source.

## DATA ELEMENT

## SERVICE

	B of A	BA	BAI	CA	DSA	EI	FA	HA	IM	IV	MGA	PAIS	PDB	TA	TTD	WAERSA
Citation Number	x	x	x	x	x	--	x	x	--	--	x	--	x	x	x	x
Personal author, first or only	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Personal author, second	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Personal author, third	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Personal author, fourth or more	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Author note (e.g., Ed., Comp.)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Author affiliation	--	x	3 dna	x	x	x	x	x	dna	x	x	x	x	x	x	x
Corporate author	x	x	--	x	x	--	x	x	--	x	x	x	x	x	x	x
Corporate author location	x	x	--	x	x	--	x	x	dna	x	x	x	x	x	x	x
Book publisher name	x	x	--	x	x	--	x	x	dna	x	x	x	x	x	x	x
Book publisher location	x	x	dna	x	x	x	x	x	dna	x	x	x	x	x	x	x
Federal contract or grant number	--	x	dna	x	x	x	x	x	dna	x	x	x	x	x	x	x
Title in full	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Title abbreviated or augmented	--	--	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Book title in original foreign language	x	x	dna	x	x	--	x	x	--	x	x	dna	--	x	--	--
Book title in translation	x	x	dna	x	x	--	x	x	dna	x	x	dna	--	x	--	--
Article title in original foreign language	--	x	dna	x	x	x	--	x	x	--	x	dna	--	x	--	--
Article title in translation	x	x	dna	x	x	--	x	x	x	x	x	dna	--	x	--	--
Serial title in full	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Serial title abbreviated	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Volume number	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Issue number	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Year	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Month	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Report number	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Page numbers, inclusive	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Country of origin	--	--	x	x	x	--	--	--	--	--	--	--	--	--	--	--
Language of original	x	--	dna	x	x	x	x	x	x	x	x	x	x	x	x	x
Language of summary	x	x	dna	x	x	--	x	x	--	x	x	dna	--	x	--	--
Note of references or illustrations	x	x	x	x	x	x	x	x	--	x	x	dna	--	x	--	--
Associated index terms	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Associated class. no. (e.g., UDC, MeSH)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Library call no.	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Source of annotation	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cross-reference to related citations	--	x	dna	x	x	--	--	--	--	--	--	--	--	--	--	--
Source (e.g., CFSTI)	x	(1)	(2)	(1)	(1)	(1)	(1)	(1)	(1)	--	x	dna	(1)	x	--	--
Price	--	x	dna	x	x	--	--	--	--	--	--	--	--	--	--	--
Physical size	--	--	dna	--	--	--	--	--	--	--	--	--	--	--	--	--

- (1) Preface announces availability from central source  
 (2) Issues give publisher and price for each periodical  
 (3) This service covers journal articles only

Table II

Bibliographic Data Elements Used in the Published Versions of Selected Secondary Services Related to Agricultural R&amp;D

Service	Author Index	Author Full Name Given	Organization Index (as Authors of Articles Indexed)	Report Number Index	Patent Number Index	Patent Concordance	Note of Library Where the Publications can be Found	Other Features
B of A	X	-	X <sup>4,5</sup>	-	-	-	X	
BA	X	-	in author index	-	-	-	-	
BAI	-	-	- <sup>4</sup>	-	-	-	-	
CA	X	when available	in author index <sup>4</sup>	-	X	X	X	
DSA	X	for women	in author index	-	-	-	X	Review articles
EI	X	-	-	-	-	-	-	
FA	X <sup>1</sup>	-	-	-	-	-	X	Review articles
HA	X	-	in author index	-	-	-	-	
IM	X <sup>1</sup>	-	- <sup>4</sup>	-	-	-	X	Bibliography of Medical Reviews
IV	X <sup>1,2</sup>	-	- <sup>4</sup>	-	-	-	-	
MGA	X <sup>1</sup>	-	in author index	-	-	-	X	
PDB	X	-	X <sup>4</sup>	-	-	-	X	Biographical Index with affiliation
PAIS	-	-	- <sup>4</sup>	-	-	-	X	Publications Analyzed; Directory of Publishers and Organizations
TTD	X	-	in author index	-	- <sup>3</sup>	-	X	
TA	X	-	in author index	-	- <sup>3</sup>	-	-	
WAERSA	X	-	in author index <sup>4</sup>	-	-	-	-	Review articles

1. Citation given under senior author, cross-references under junior authors.
2. Author index merged with subject index.
3. None, but all patent abstracts grouped together.
4. Organizations as subjects given in subject index.
5. Through 1967 organization index included organizations as subjects.

Table III

Indexing and Access Features (Non-Subject) Provided with Each Issue of Selected Secondary Services



## 2. Subject Access

The basic styles and formats of subject indexes of these services were illustrated earlier in Fig. 2. Details of the subject access features provided with each issue of each of the services are given in Table IV. Several of the services include cross-reference statements in the index. A few of the services have a subject index separate from the citations, and directly yield only a reference number, as shown in the samples from B of A, BA Biosystematic and CROSS, CA, MGA, and WAERSA in Fig. 2; and two services have indexes of the same general type that directly yield a brief citation instead of a reference number (see the samples from BA B.A.S.I.C. and PDB in Fig. 2). Seven of the services simply list the full citation under a single subject access point, in the manner of a classified bibliography.

### D. INDEXING AND ACCESS FEATURES PUBLISHED ANNUALLY OR CUMULATIVELY

#### 1. Non-Subject Access

Two of the services (IV, PDB) provide no annual indexes or cumulations.\* One service (CA) cumulates semi-annually and quinquennially only. All but four of the services provide annual author indexes, with generally less than the full name, and never with any indication of the author's affiliation or address. Those services which provide corporate author indexing in their monthly issues, a majority, provide such indexing annually. None of these services provide an annual report number index, and only one of them provides a patent number index. Several other special features are provided in cumulations, notably the cumulative Translations Index of MGA and Bibliography of Medical Reviews of IM. Fig. 3 includes examples of these special indexes. Details for the non-subject access features for each of the services are given in Table V.

#### 2. Subject Access

Some of the services cumulate the subject indexes from single issues; others provide only an annual index. Only one service (CA) regularly cumulates subject indexes over a period longer than annual. One other service (HA) has published a cumulated index for 1931-1960.

Most of the services which have an annual subject index post a reference number under one or more subject access points. Four services

---

\* Since the completion of this study, NAL has announced the publication of the first semi-annual Cumulative Index to PDB, to cover the January 1 to June 7, 1968 issues.

Service	Subject Index		Complete Citations Grouped Under Subject Headings		Cross-Reference Statements Supplied	Other Features
	Yielding Only a Reference Number	Yielding a Brief Citation	Under One Access Point Only	Under One or More Access Points		
B of A	X	-	X	-	X	
BA	CROSS, Biosystematic	B.A.S.I.C. <sup>1</sup>	X	-	-	
BAI	-	-	-	X	X	
CA	X	-	X	-	X	
DSA	-	-	X	-	-	
EI	-	-	X	-	X	
FA	-	-	X	-	-	
HA	-	-	X	-	-	
IM	-	-	-	X	-	
IV	-	-	-	X	X	
MGA	X	-	X	-	X	Geographic index
PDB	-	X	X	-	-	
PAIS	-	-	-	X	X	
TTD	-	-	X	-	-	
TA	-	-	X	-	-	
WERSA	X	-	X	-	X	Geographic index

1. Published under separate cover

Table IV

Subject Access Features Provided With Each Issue of Selected Secondary Services

**FA  
Species Index**

**Abies spp.**  
age estimation 6164  
diseases and disorders 2468  
injury by  
  tumes 2391, 5778  
  mistletoe 5837  
insect pests 4150, 5963-4, 5968  
leaves 5128  
light relations 3450  
litter/humus 5019  
mycorrhiza 5289  
phenology 5330  
pollen 1331-2  
radiation, effects of p. 3  
seed production 5493  
seedlings 3450  
taxonomy 5128  
wood  
  borers 982  
  decay 6565  
  fibrebord 1547  
  oils and resin 3086  
  physical and mechanical  
    properties 2769  
  puling 3086  
**A. alba** 439  
diseases and disorders 2503, 4035  
distribution 366  
ecology 134, 3549, 5217  
fertilizers 3824  
forest types 1994, 1897, 3549, 3555,  
  5365, 5372  
fungi associated with 4179  
genetics/breeding 5143

**Fig. 3**  
**Examples of Sepecialty Indexes Provided Annually**

3  
Fig.

IM

Bibliography of Medical Reviews  
Subject Index

\*\*

MGA

Cumulative Translations Index

**ACOUSTIC NERVE (A8)****DRUG EFFECTS**

[Remarks on the problem of indications and the so-called detoxication of streptomycin (dihydrostreptomycin)] Mückter H, et al. *Deutsch Med Wochr* 91:2181-3, 2 Dec 66 (82 ref.) (Ger)  
[Toxic lesions of the 1st and 8th pairs of cranial nerves in the course of antitubercular chemoprebiotic therapy. (Collective review)] Grande F, et al. *Arch Tisiol* 21:Suppl:109-28, May 66 (68 ref.) (It)

**ACOUSTIC TRAUMA (C11, C14)**

A review of hearing damage risk criteria. Acton WL. *Ann Occup Hyg* 10:143-53, Apr 67 (49 ref.)  
[Review of the research into the injurious effect of noise] Kubix S. *Prac Lek* 18:224-5, Jun 66 (24 ref.) (Slvk)

**PREVENTION & CONTROL**

[Current prevention of occupational acoustic trauma] Suikowski W. *Med Pracy* 18:51-9, 1967 (71 ref.) (Pol)

**ACRIDINES (D2, D13)**

Cytochemical studies with acridine orange and the influence of dye contaminants in the staining of nucleic acids. Kasten FH. *Int Rev Cytol* 21:141-202, 1967 (238 ref.)

ACRIFLAINE see under ACRIDINES (D2, D13)

\*\* Also provided monthly

Abramowicz M, Kass EH: Pathogenesis and prognosis of prematurity. *New Eng J Med* 275:1053-9 concl, 10 Nov 66 (50 ref.)  
Abramowicz M, Kass EH: Pathogenesis and prognosis of prematurity. *New Eng J Med* 275:1001-7 concl, 3 Nov 66 (53 ref.)  
Abramowicz M, Kass EH: Pathogenesis and prognosis of prematurity. *New Eng J Med* 275:938-43 concl, 27 Oct 66 (60 ref.)  
Abrams HL, see Kupitz EA  
Abramson DI: Medical treatment of arterial disorders of the extremities. *Mod Treatm* 1:350-69, Mar 67 (8 ref.)  
Abramson RA: LSD in psychotherapy and alcoholism. *Amer J Psychother* 20:415-38, Jul 66 (34 ref.)  
Accary JP, see Bonafils S  
Acher R: Evolutionary aspects of the structure of proteins. *Chem [Eng]* 5:798-806, Sep 66 (21 ref.)  
Ackers GW: Chem [Eng] 5:798-806, Sep 66 (21 ref.)  
Ackers GW: Chem [Eng] 5:798-806, Sep 66 (21 ref.)  
Ackerman AJ: see Silver D  
Ackerman NB: Scanning and irradiation of the liver with radioisotopes. *Amer J Surg* 112:383-7, Sep 66 (26 ref.)  
Acton WL: A review of hearing damage risk criteria. *Ann Occup Hyg* 10:143-53, Apr 67 (49 ref.)  
Ada GL: Relationship of antigen to the formation of antibodies. *Aust Ann Med* 15:17-23, Feb 66 (19 ref.)  
Adamkiewicz Z: Zagadnienie fizjologicznej przemiany w sarkoplazmie dojrzalym. *Pol Tyg Lek* 22:1006-8, 26 Jun 67 (18 ref.) (Pol)  
Adamkiewicz Z: Mechanizm pracy dużych gruczołów

Abetti, Giorgio  
Stars and planets [Transl. from Italian]. 18.6-5  
Agostinho, Jose  
Notes on some tsunamis of the Azores [Transl. from French]. 18.3-687  
Akademia Nauk SSSR  
First panoramas of the Lunar surface according to the material from the automatic station Luna-9 [Transl. from Russ]. 18.2-582  
Investigations of the upper atmosphere and outer space carried out in the USSR in 1964. [Transl. from Russ]. 18.9-1  
Akademia Nauk SSSR. Astronomicheskii Sovet  
Optical instability of the Earth's atmosphere (vost. Pulkovo. Astronomicheskaja Observator-ia) [Transl. from Russ.]. 18.8-533  
Akademia Nauk URSR, Kiev  
Physics of comets and meteors [Transl. from Russ.]. 18.8-653  
Akademia Nauk Ukrainoi RSR, Kiev Glavnaia Astronomicheskaja Observator-ia  
Physics of the Moon and the planets [Transl. from Russ.]. 18.2-14

Fig. 3 (concluded)

Examples of Specialty Indexes Provided Annually

Service	Author Index	Author Full Name Given	Organization Index (as Authors of Articles Indexed)	Report Number Index	Patent Number Index	Patent Concordance	Note of Library Where the Publications can be Found	List of Publications Covered	Other Features
B of A	X	-	<sup>4,5</sup>	-	-	-	X	-	
BA	X	-	in author index <sup>4</sup>	-	-	-	-	separate publication	
BAI	-	-	<sup>4</sup>	-	-	-	-	X	
CA	X <sup>1</sup>	when available	in author index <sup>4</sup>	-	X	X	- <sup>6</sup>	separate publication	
DSA	X	for women	in author index <sup>4</sup>	-	-	-	X	X	
EI	X	-	-	-	-	-	X	periodical and serial publications only	
FA	X <sup>2</sup>	-	-	-	-	-	- <sup>6</sup>	-	
HA	X	-	in author index <sup>4</sup>	-	-	-	-	-	
IM	up to three authors <sup>1</sup>	-	<sup>4</sup>	-	-	-	X	X	List of Medical Subject Headings; Bibliography of Medical Reviews
IV	no cumulations								
MGA	X <sup>1</sup>	when available	in author index	contracts grants	-	-	- <sup>6</sup>	selected list	Cumulative Translations Index
PDB	no cumulations <sup>3</sup>								
PAIS	-	-	<sup>4</sup>	-	-	-	X	X	Publications Analyzed; Directory of Publishers and Organizations
TTD	X	-	in author index	-	-	-	X	-	
TA	X	-	in author index	-	-	-	-	-	
WAERSA	X	-	in author index <sup>4</sup>	-	-	-	-	X	

1. Citation under senior author only, cross-reference under junior authors.
2. Reference number under senior author, cross-reference under junior authors.
3. Semi-annual cumulative index announced after completion of this study.
4. Organizations as subject given in subject index.
5. Through 1967 organization index included organizations as subjects.
6. CA includes holdings in List of Periodicals Abstracted; FA and MGA give location with abstract.

Table V

Indexing and Access Features (Non-Subject) Provided Annually and Cumulatively by Selected Secondary Services

publish the complete citation in the cumulations. Almost all of the services included cross-reference statements. Some of the special indexes included in annual indexes and cumulations are special subject indexes, notably the following:

- Formula Index (CA)
- Index of Ring Systems (CA)
- Hetero-Atom-in-Context Index (CA)
- Species Index (FA)
- Geographic indexes (FA, MGA, WAERSA)

Examples of some of these are included in Fig. 3. Details of the subject access features provided annually and cumulatively for each of the services are given in Table VI.

#### E. AN EXAMPLE OF THE INDEXING GIVEN TO THE SAME DOCUMENT BY SEVEN SERVICES

One specific example of the variation in format and extent of indexing treatment given by the various services is given by the citation shown in Fig. 4. This illustration shows the indexing provided by seven different services for the same journal article.

Service	Subject Index		Complete Citations Cumulated Under Subject Headings		Cross-Reference Statements Supplied	Other Features
	Frequency	Yields Only a Reference Number	Yields a Brief Citation	Under One Access Point Only	Under One or More Access Points	
B of A	Annual <sup>2</sup>	X	-	-	-	X
BA	Annual <sup>2</sup>	Biosystematic, CROSS	B.A.S.I.C.	-	-	..
BAZ	-	-	-	-	qly, annual	X
CA	Semiannual Quinquennial <sup>2</sup>	X	-	-	-	X
DSA	Annual	X	-	-	-	X
EI	-	-	-	annual	-	X
FA	Annual	X	-	-	-	X
HA	Annual	X	-	-	-	X
IM	-	-	-	-	annual	X
IV	no cumulations					
MGA	Annual <sup>2</sup>	-	Yields author and reference no.	-	-	X
PDB	no cumulations <sup>1</sup>					
PAIS	-	-	-	-	4 a year; annual	X
TTD	Annual <sup>1</sup>	X	-	-	-	X
TA	Annual	X	-	-	-	-
WASRA	Annual <sup>2</sup>	X	-	-	-	X

1. Semiannual cumulative index announced after the completion of this study

2. Cumulated from subject indexes in each issue

Table VI

Subject Access Features Provided Annually and Cumulatively by Selected Secondary Services

B of A  
Citation  
Monthly Issue

57490 BOSCH, L., BONNET-SMITS, E. M., and  
DUIN, J. VAN. In situ breakage of turnip  
yellow mosaic virus RNA and in situ aggrega-  
tion of the fragments. Virology 41(3):453-466  
Ref. Mar.1967. 448.6 v81

B of A  
Subject Index  
Monthly Issue

NUCLEIC ACIDS	
ANALOGS	56102
EFFECTS ON ARABIDOPSIS	
ITALIANA	56102
IN APPLE	56444*
IN BIAN	56530
IN BRASSICAUELLA EMPSONII	56557
IN BRASSICAUELLA	56558
IN CHLAMYDOMONAS REINHARDI	56522
IN CUKRANTS	56483*
IN DICTYOSTELIUM DISCOIDEUM	56177
IN DROSOPHILA MELANOGASTER	56452
IN DRYOPTERIS FILIXMAS	56073*
IN EUGLENA GRACILIS	56191
IN JERUSALEM ARTICHOKE	56571
IN LETTUCE	56556
IN LOCUSTA MIGRATHRIA	56945
IN LILIUM TEMULENTUM	56393
IN MUSCA DOMESTICA	56407*
IN ONCOPELTUS FASCIATUS	56467
IN UNION	56719*
IN PEAS	56541*
IN PHYSARUM POLYCEPHALUM	56065
IN PLANTS	56187*
IN POTATOES	56207*
IN RADISHES	56527
IN RAT PHYSIOLOGY	56934
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**TURNIP yellow mosaic virus**  
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## PLANT HOST VIRUSES

(See also "Virus Diseases" under Phytopathology:

† 112737. BOSCH, L., E. M. BONNET-SMITS, and J. VAN DUIN. (Dep. Biochem., State Univ. Leiden, Leiden, Neth.) In situ breakage of turnip yellow mosaic virus RNA and in situ aggregation of the fragments. *VIROLOGY* 31(3): 453-460. illus. 1967. -Turnip yellow mosaic virus (TYMV) has been treated at alkaline pH (10.5-11.5) and high ionic strength (1.0 M KCl) at 30° for 8 minutes. According to Kaper and Halperin such a treatment causes in situ breakage of the viral RNA chain, yielding fragments of uniform size (about 5 S). In the present paper, it is demonstrated that in situ fragmentation is accompanied by in situ aggregation of the RNA fragments. The aggregate can be released as such from the capsid with phenol and sediments more rapidly and more uniformly than TYMV-RNA. It is assumed that each aggregate molecule is derived from one virus particle and has adopted a structure which is more compact than that of TYMV-RNA. Deaggregation, which is essentially irreversible outside of the capsid, can be accomplished by (a) heating at 55° for 2 minutes; (b) treatment with dimethylsulfoxide; (c) the successive removal of divalent and monovalent cations. Below limiting temperatures aggregates of intermediate sizes persist when the heating is prolonged. Possible models for the structure of the aggregate are discussed. --Authors.

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BREEDING		THE IN-VITRO HYDROLYSIS OF LEAF PROTEINS. I. THE ACTION OF PAPAON ON PROTEIN EXTRACTED FROM THE LEAVES OF ZEA-MAYS. II. THE ACTION OF PAPAON ON PROTEIN CONCENTRATES EXTRACTED FROM LEAVES OF DIFFERENT SPECIES.	09676
PLANT-BREEDING-INSTITUTE, CAMBRIDGE, ANNUAL REPORT -1964-65 +INCLUDES BREEDING PLANTS FOR RESISTANCE TO DISEASES+.	10165	INBRED	
		RADIATION STUDIES ON MICE OF AN INBRED TUMOR/RESISTANT STRAIN. THE ALTERATION OF ENDOGENOUS SUSCEPTIBILITY TO ANEUPLOIDYSIS BY X-IRRADIATION.	10221

Fig. 4 (continued)

Indexing Applied to One Document by Seven Services

PDB  
Subject Index (cont.)  
Bi-Weekly Issue

- MOSAIC (CONTINUATION)  
NEMATODE-TRANSMITTED VIRUSES +TOBACCO RATTLE, TOMATO BLACK RING, ARABIS MOSAIC, AND STRAWBERRY LATENT RING SPOT+ IN BRITISH NARCISSUS CROPS. 09655  
+TOBACCO+ MOSAIC+ YOU CAN CONTROL IT. 10345
- MOSAIC-VIRUS IN-SITU BREAKAGE OF TURNIP YELLOW MOSAIC-VIRUS RNA AND IN-SITU AGGREGATION OF THE FRAGMENTS. 09623 ←
- THE OCCURRENCE OF CUCUMBER MOSAIC-VIRUS AND FOUR NEMATODE-TRANSMITTED VIRUSES +TOBACCO RATTLE, TOMATO BLACK RING, ARABIS MOSAIC, AND STRAWBERRY LATENT RING SPOT+ IN BRITISH NARCISSUS CROPS. 09655  
DIFFERENTIATION OF PLANTS FROM TOBACCO MOSAIC-VIRUS INCLUSION-BEARING AND INCLUSION-FREE SINGLE TOBACCO CELLS. 09697  
131-1 TOBACCO MOSAIC-VIRUS INHIBITION OF HEMOLYSIN FORMATION IN RABBITS. 09718  
EXPERIMENTAL DETERMINATION OF HOST PLANTS OF PEA MOSAIC-VIRUS ISOLATED IN CZECHOSLOVAKIA. (CZECH) 09983  
INACTIVATION OF PURIFIED PLANT VIRUSES +TOBACCO MOSAIC-VIRUS, ALFALFA MOSAIC-VIRUS, AND CUCUMBER MOSAIC-VIRUS+ AND THEIR NUCLEIC ACIDS BY PHOTSENSITIZING DYES. 10133
- RIVERSIDE (CONTINUATION)  
UNIVERSITY-OF-CALIFORNIA, RIVERSIDE. 09810
- RNA IN-SITU BREAKAGE OF TURNIP YELLOW MOSAIC-VIRUS RNA AND IN-SITU AGGREGATION OF THE FRAGMENTS. 09623 ←
- INHIBITION OF RNA SYNTHESIS AND AUXIN INDUCED CELL WALL EXTENSIBILITY AND GROWTH BY ACTINOMYCIN-D +SOYBEANS, MAIZE, AND AVENA+. 09709  
THE BINDING OF 14-C PHENYLALANYL-S RNA TO WHEAT GERM RIBOSOMES. 09844  
GIBBERELLIN INDUCED YEAST +SACCHAROMYCES-ELLIPSOIDEUS+ SPORULATION IN RELATION TO RNA AND PROTEIN METABOLISM. 09940
- ROASTING ARE SALMONELLAE IN THE MEAT OF HARES AND CHICKENS KILLED BY ROASTING OR GRILLING. (GERMAN) 09845
- TURFGRASS  
TURFGRASS DISEASES TROUBLESOME. 09712
- TURKEYS  
VACCINATION IN CONTROLLING PARACOLON-ARIZONA INFECTION IN TURKEYS. 09893  
INFLUENCE OF CHOLESTEROL ON ESTROGEN INDUCED AORTIC RUPTURES IN TURKEYS. 10268
- TURNIP IN-SITU BREAKAGE OF TURNIP YELLOW MOSAIC-VIRUS RNA AND IN-SITU AGGREGATION OF THE FRAGMENTS. 09623 ←
- TURNOVER  
ALBUMIN TURNOVER IN FASCIOLIASIS +FASCIOLA-HEPATICA IN RABBITS+. 09739  
STORAGE POOLS AND TURNOVER SYSTEMS IN GROWING AND NON-GROWING +CARROT+ CELLS. EXPERIMENTS WITH 14-C SUCROSE, 14-C GLUTAMINE, AND 14-C ASPARAGINE. 10309
- TYLOCINE  
REPORT ON TYLOCINE INJECTIONS IN SOWS AND PIGLETS. 09586
- YEAST  
EFFECT OF AUXIN AND GIBBERELLIN ON SPORULATION IN YEAST +SACCHAROMYCES-ELLIPSOIDEUS+. 09939  
GIBBERELLIN INDUCED YEAST +SACCHAROMYCES-ELLIPSOIDEUS+ SPORULATION IN RELATION TO RNA AND PROTEIN METABOLISM. 09940
- YELLOW IN-SITU BREAKAGE OF TURNIP YELLOW MOSAIC-VIRUS RNA AND IN-SITU AGGREGATION OF THE FRAGMENTS. 09623 ←
- YELLOWING  
THE RELATION OF ANNUAL INCIDENCE OF BEET YELLOWING VIRUSES IN SUGAR-BEET TO VARIATIONS IN WEATHER. 10398
- YELLOWING-DISEASE  
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- YELLOWING  
A POSSIBLE CORRELATION BETWEEN SUGAR-BEET YELLOWING INCIDENCE AND SUNSPOT ACTIVITY. 09822

Fig. 4 (continued)

Indexing Applied to One Document by Seven Services



TA  
Citation  
Monthly Issue

Diseases - virus  
See also # 1180, 1481, 1495, 1498

BOSCH, L.; BONNET-SMITS, E. M.; VAN DUIN, J.

In situ breakage of turnip yellow mosaic virus RNA and in situ aggregation of the fragments. Virology 31(3): 453-60, Mar. 1967. graphs.

Turnip yellow mosaic virus (TYMV) has been treated at alkaline pH (10.5-11.0) and high ionic strength (1.0 M KCl) at 30° for 8 minutes. According to Kaper and Halperin (1965) such a treatment causes in situ breakage of the viral RNA chain, yielding fragments of uniform size (about 5 S). In the present paper it is demonstrated that in situ fragmentation is accompanied by in situ aggregation of the RNA fragments. The aggregate can be released as such from the capsid with phenol and sediments more rapidly and more uniformly than TYMV-RNA. It is assumed that each aggregate molecule is derived from one virus particle and has adopted a structure which is more compact than that of TYMV-RNA. Deaggregation, which is essentially irreversible outside of the capsid, can be accomplished by heating at 55° for 2 minutes; treatment with dimethylsulfoxide; the successive removal of divalent and monovalent cations. Below limiting temperatures aggregates of intermediate sizes persist when the heating is prolonged. Possible models for the structure of the aggregate are discussed. (Abstract) 1106

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RIBONUCLEIC ACID TMV ORIENTATION	620
RIBONUCLEIC ACID TMV PHOSPHODIESTERASE EFFECT	1864
RIBONUCLEIC ACID TMV PYRIMIDINE DIMER	1552
RIBONUCLEIC ACID TMV SYNTHESIS ANTIBIOTICS EFFECT	1220
→ RIBONUCLEIC ACID TURNIP YELLOW MOSAIC VIRUS BREAKAGE	1196 ←
RIBONUCLEIC ACID VIRAL REPLICATION	1550
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Fig. 4 (continued)

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BONVENTRE, P. F.	2614
BOOKER, W. M.	1298
BOOTHROYD, R. A.	1084
BORDA, S. A.	581
BORDEAUX, A. F., JR.	630
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BORGWALDT, H.	371
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BORTNER, C. E.	2392 2572 2943
BORZELLECA, J. F.	1308
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VAN DER SLUYS, H.	2236
VAN DER STRAETEN, P. J.	2064
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VAN DER WAL, A. M.	1063
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Fig. 4 (concluded)

Indexing Applied to One Document by Seven Services

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### III. RELATIVE INDEXING

#### A. PROCEDURE

This part of the study concentrated on an examination of the indexing actually applied by these services to a number of selected citations. The basic materials for this part of the study consisted of more than 2,000 citations from B of A that were indexed both by B of A and one or more of the fifteen other secondary services.

These original citations were from a uniform random sample of over 5,000 citations that were extracted from the 1967 B of A and used for the previously mentioned study of the overlap of B of A and these other services.\* This uniform random sample of over 5000 citations (5.4 percent of 1967 B of A publication) was selected from the total 1967 B of A production of 94,238 citations. Because the B of A citations are printed only once in the subject section of an issue, and are assigned a unique serial number as indicated in a representative page shown in Fig. 5, it was easy to obtain a uniform random sample. Every 20th citation was selected for analysis, as well as every 326th citation, to boost the total sample size to over 5,000. This sample of citations formed the basis for many of the findings of the reports on this project.

Each citation in the sample was annotated to show such things as its national origin, language, and form of publication. Different parts of the citation (e.g., author, title, date) were also annotated with data field tags for subsequent computer processing and file building. The citation was keypunched in a format for the INFOL file management system, for subsequent running on a CDC-3800 computer.\*\* A total of 170 data elements (i.e., data fields) were established for each of the citation records in this file. Further description of this computer file and the associated procedures are given in earlier IGC project reports.\*\*\* These reports describe the searching which identified the citations indexed jointly by B of A and another service.

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\* Bourne, Charles P. Overlapping Coverage of Bibliography of Agriculture by 15 Other Secondary Services. Report No. IGC-FA-69-39. 1 June 1969.

\*\* 3600/3800 Computer Systems INFOL Reference Manual. Control Data Corporation, Palo Alto, California, July 1966.

\*\*\* Bourne, Charles P. op.cit.

- 70252 PASENKOV, A. K. New eastern type persimmon variety. (Rus) Sadovodstvo 12:26-27. Dec.1966. 80 Sa13
- 70253 RANDHAWA, G. S., and others. The mango varieties of Goa. Indian Hort. 10(1):21-22. Oct./Dec.1965. 80 In23  
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- 70258 THOMAS, C. A. Kodapuli [Garcinia cambogia]; little known but rewarding fruit. Indian Hort. 10(1):5-6. Oct./Dec.1965. 80 In23
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Culture.
- Deciduous Fruits
- 70263 ALDERMAN, D. C. Apple rootstock trends in North America. Fruit Varieties Hort. Dig. 20(2):24-28. Apr.1966. 80 F9464  
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- 70283 ROLLINS, H. A. A second look at dwarfing rootstocks for apples. Mountaineer Grower 262:28-34. Mar.1966. 80 M86
- 70284 SIMONS, R. K. Anatomical observations on the East Malling rootstock breakdown. Ill. State Hort. Soc. Trans. 99:86-93. 1965, pub.1966. 81 IL6  
Includes propagation by grafting of apples.
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All of the index terms obtained from the services for these citations were added to the computer file with the associated citations. This computer file of citations and the accompanying indexing data from each of the services were used to generate several types of printouts that provided the starting materials for this part of the study.

The index terms for these sample citations were obtained as a result of cooperative arrangements with several of the services. The comprehensive nature of this study would not have been possible without their generous support and assistance, particularly Chemical Abstracts Service, BioSciences Information Service of Biological Abstracts, and the National Library of Medicine. The literature searching done for our earlier overlap study identified those B of A citations in the sample that were covered by these 15 other services. Special computer runs were made to extract a bibliography of B of A citations known to be covered by each of the other services (e.g., CA) and to print them in a sequence convenient for the other service (e.g., by CA abstract number). This bibliography was sent to that service for their searching and annotation necessary to furnish the associated index terms. In most cases, the terms were extracted from original worksheets, computer files, and other records of the service. In a few cases, the services re-indexed the material in a way that was representative of their original production indexing. A summary of the procedures used to obtain the index terms for each service is given in Table VII. It is felt that even though some special procedures and re-indexing were required, the index terms used for this study generally represent the depth and quality of indexing regularly given by these services.

Source of Index Terms

- service of A
- A computer listing by B of A number of all index terms applied to each B of A citation was supplied by NAL.
- BA After publication of BA indexes, the source records are not kept in a form that would easily permit the identification of all index terms supplied to a particular citation. Consequently, BA worked from the furnished bibliography of overlapped citations, obtained the original documents, and re-indexed in the same manner as done in its regular production indexing. Terms were separately identified for the B.A.S.I.C., Biosystematic, and CROSS indexes to BA.
- BAI BAI was unable to furnish any records of the terms used with a particular citation. Consequently, only one term was used -- the one under which the citation was found during the literature search.
- CA Given a bibliography of the CA citations overlapping with B of A, CA was able to extract all the associated index terms from its manual and machine files.
- DSA Index terms were supplied by DSA in response to a furnished bibliography of DSA citations that overlapped with B of A.
- EI By policy, EI places a citation only under one subject heading. The B of A citations found in EI by the searchers were annotated with the associated subject heading which was then used for this study.
- FA FA index terms were unavailable.
- HA Index terms were supplied by HA in response to a furnished bibliography of HA citations that overlapped with B of A.
- IM Index terms were furnished by NLM in response to a furnished bibliography of IM citations that overlapped with B of A. Terms were separately identified for those that were used in IM, and those that were included only in the MEDLARS computer file.
- IV IV index terms were unavailable.
- MGA MGA index terms accompany each abstract in the printed MGA issues. These were found and recorded by the searchers during the overlap study.

Table VII

Sources of Index Terms Used in Indexing Study

Source of Index Terms

- PDB** PDB has no annual index, and until late 1967 there was no way to pull together all the index terms associated with a particular citation. PDB used a KWIC index program to generate the index terms automatically from the title, which may be augmented by the PDB editor. For this study this indexing procedure was simulated by our analysts who manually performed the same type of KWIC indexing, with the assistance of 2 stop word lists furnished by NAL, to identify all possible index terms in the title. This probably introduced some additional errors into this process, but it is felt that this was a very good approximation. Further error was introduced by the fact that different stop word lists were used by the KWIC program at different times during 1967, but there were no records available to show which list was used for which issues. Beginning with the December 8, 1967 issue, subject descriptors were printed in PDB with the citations. These descriptors were recorded by the searchers.
- PAIS** PAIS was unable to furnish any records of the terms used with any particular citation. Consequently, only one term was used -- the one under which the citation was found during the literature search.
- TTD** Index terms were supplied by TTD in response to a furnished bibliography of TTD citations that overlapped with B of A. Terms were separately identified for the printed issues as well as the computer file.
- TA** Index terms were supplied by TA in response to a furnished bibliography of TA citations that overlapped with B of A.
- WAERSA** Index terms were supplied by WAERSA in response to a furnished bibliography of WAERSA citations that overlapped with B of A. One set of terms was supplied to correspond to the present indexing system, and another set of terms was supplied to correspond to the planned new indexing system.

Table VII (Concluded)

Sources of Index Terms Used in Indexing Study



## B. AVERAGE NUMBER OF SUBJECT ACCESS POINTS PER CITATION

### 1. Absolute Number

Measures of the average number of subject access points per citation for BA\* and CA\*\* have been published. IGC staff analyzed several other services to get additional measures. These data are shown below.

<u>Service</u>	<u>Total Number of Citations in Sample</u>	<u>Total Number of Subject Access Points in Sample</u>	<u>Average Number of Subject Access Points Per Citation</u>	<u>Data Analyzed</u>
B of A	94,238	231,898	2.5	NAL computer listing of all index terms assigned to B of A citations in 1967
BA	5,209	B.A.S.I.C. 44,160 Biosystem- atic 6,600 CROSS 35,813 Total 86,573	8.5 1.3 6.9 16.6	October 15, 1967 issue*
CA	93,000	580,700	6.2	January-June 1964 (Vol. 60)**
MGA	754	1,394	1.8	December 1967 issue
PDB	842	3,333	4.0	May 10, 1968 issue
TA	2,966	4,119	1.4	All 1967 issues
TTL	10,926	15,490	1.4	1967 annual cumulation

These measures are not directly comparable because the data analyzed were not selected according to any consistent criteria, and thus they have no direct interrelation. There is no intended correlation by subject, time period, or quantity.

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\*Zabriskie, K.H., Jr. and A. Farren, "The B.A.S.I.C. Index to Biological Abstracts," American Journal of Pharmaceutical Education, v. 32, no. 8, May 1968, p. 190

\*\*Wetsel, F.R., "Time Studies in Producing Subject Indexes for Chemical Abstracts," Journal of Chemical Documentation, v. 5, no. 4, November 1965, p. 212.

## 2. Relative Number

A more meaningful measure may be obtained by comparing the number of subject access points provided by B of A and another service for the same citations. The computer file of citations covered jointly by B of A and each of the other services included the index terms supplied by the services as described earlier. By using the INFOL file manipulation capabilities, a special printout was made which listed and counted all the index terms supplied by a particular service in regular issues and in computer data banks to those citations indexed jointly with B of A (see Fig. 6). Another listing was made of the terms supplied by B of A and each other service to the citations covered by both (see Fig. 7). From these printouts, a count of the terms supplied by both services for the identical collections of citations (i.e., citations that have index terms recorded from both services) was made. This count provided a relative measure of the average number of subject access points provided by each service for exactly the same collection of original documents. These data are illustrated in Fig. 8 and summarized in Table VIII.

These data show that two services (BA and TTD) furnished more than four times as many access points as B of A for the same citations. These two services provided an average of more than 10 subject access points per citation. However, in the case of TTD this number includes the large number in the computer data bank; the printed issues of TTD averaged only 1.67 terms per citation. The data indicate that for the same material four printed services provided at least 30 percent more index terms, and at least three other services provide roughly as many. Including the terms in computer files, six of the eleven services thus studied provided more index terms than B of A.

## C. RELATIONSHIP OF TERMS APPLIED BY TWO SERVICES TO THE SAME DOCUMENT

### 1. Procedure

#### a. The Need for a Measure

One of the main objectives of this indexing study effort was to show the relationship of B of A indexing to the indexing provided to the same material by other secondary services. Comparisons have been made between the language of indexing systems,\* but the examination that we

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\* Painter, Ann F. An Analysis of Duplication and Consistency of Subject Indexing Involved in Report Handling at the Office of Technical Services. Ph.D. Thesis, Rutgers, The State University, 1963.

# INVERSION OF BIOLOGICAL ABSTRACTS BASIC INDEX TERMS

1	ALPHA	08720 05380	15240 23880 31623 31640 48600 55095 55767 55800 57700 57700 62980 63040 77320 80520
2	ALPHA	08360	08360
3	ALPHA	48620	48620
4	ALPHA	23840 31820 31860 32180 45080 49100 49140 56440 63100	23840 31820 31860 32180 45080 49100 49140 56440 63100
5	ALPHA	0340 32100 40320 49140 56600	0340 32100 40320 49140 56600
6	ALPHA	71800	71800
7	ALPHA	23740	23740
8	ALPHA	02280	02280
9	ALPHA	0460	0460
10	ALPHA	30500	30500
11	ALPHA	45080	45080
12	ALPHA	54760	54760
13	ALPHA	08220	08220
14	ALPHA	05560	05560
15	ALPHA	05500	05500
16	ALPHA	4800	4800
17	ALPHA	55980	55980
18	ALPHA	12520 74320	12520 74320
19	ALPHA	31560	31560
20	ALPHA	22080	22080
21	ALPHA	74320	74320
22	ALPHA	0800	0800
23	ALPHA	08000	08000
24	ALPHA	02140	02140
25	ALPHA	13030	13030

Fig. 6  
Sample of List of Index Terms  
Used by Another Service on  
Citations Indexed Jointly  
with B of A



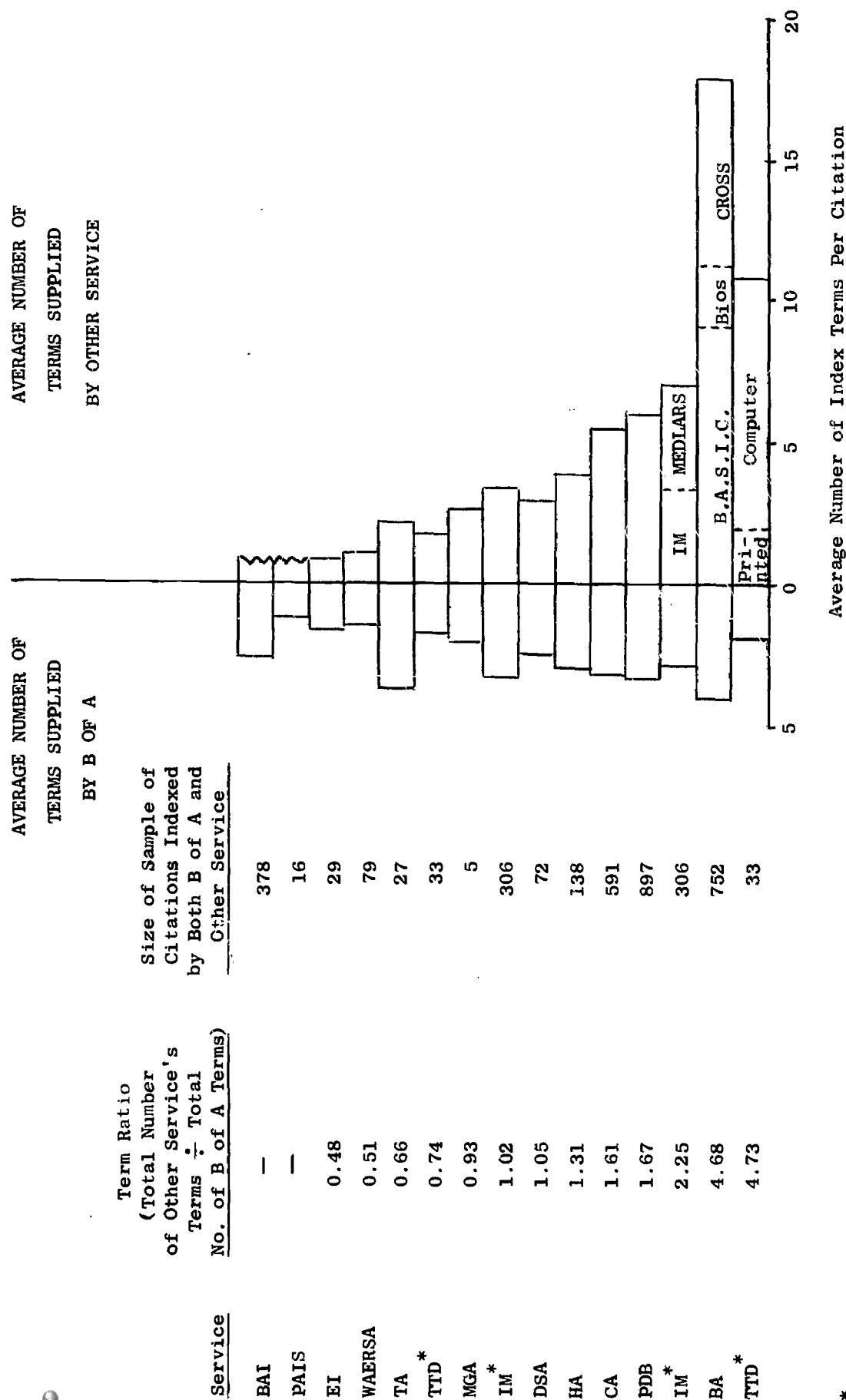
## COMPARISON OF B OF A WITH INDEX MEDICUS--INDEX TERMS

B OF A SEQUENCE NUMBER 11060	THIOREDOXIN FROM LACTOBACILLUS LEICHMANNII AND ITS ROLE AS HYDROGEN DONOR FOR RIBONUCLEOSIDE TRIPHOSPHATE REDUCTASE
B OF A SECTION HEADING B OF A INDEX TERMS	NUCLEOSIDES IN LACTOBACILLUS LEICHMANNII * THIOREDOXIN IN LACTOBACILLUS LEICHMANNII * REDUCTASE IN LACTOBACILLUS LEICHMANNII * LACTOBACILLUS LEICHMANNII BIOCHEMISTRY * TRIPHOSPHATES IN LACTOBACILLUS LEICHMANNII * HYDROGEN IN LACTOBACILLUS LEICHMANNII * BACTERIAL PROTEIN/METABOLISM * ESCHERICHIA COLI/ENZYMOLGY * LACTOBACILLUS/ENZYMOLGY * OXIDOREDUCTASES/METABOLISM
IM INDEX TERMS	BACTERIAL PROTEIN/METABOLISM
IM MEDLARS TERMS	BACTERIAL PROTEIN/METABOLISM * ELECTROPHORESIS * ESCHERICHIA COLI/ENZYMOLGY * GUANINE NUCLEOTIDES/METABOLISM * KINETICS * LACTOBACILLUS/ENZYMOLGY * NADP/METABOLISM * OXIDOREDUCTASES/METABOLISM
B OF A SEQUENCE NUMBER 18760	GAS-LIQUID CHROMATOGRAPHIC ANALYSIS OF MILK FAT, RAPID PREPARATION OF BUTYL ESTERS.
B OF A SECTION HEADING B OF A INDEX TERMS	AGRICULTURAL PRODUCTS * DAIRY PRODUCTS * ANALYSIS AND COMPOSITION
B OF A INDEX TERMS	CHROMATOGRAPHY IN MILK RESEARCH * MILK FAT ANALYSIS
IM INDEX TERMS	BUTYRATES * FATTY ACIDS/ANALYSIS * MILK/ANALYSIS
IM MEDLARS TERMS	BUTYRATES * CATTLE * CHROMATOGRAPHY, GAS * FATTY ACIDS/ANALYSIS * MILK/ANALYSIS
B OF A SEQUENCE NUMBER 43180	CHANGES IN MILK PROTEINS TREATED WITH HYDROGEN PEROXIDE
B OF A SECTION HEADING B OF A INDEX TERMS	AGRICULTURAL PRODUCTS * DAIRY PRODUCTS * ANALYSIS AND COMPOSITION
B OF A INDEX TERMS	HYDROGEN PEROXIDE EFFECTS ON MILK * MILK PROTEINS * PROTEINS CHEMISTRY
IM INDEX TERMS	CASEIN * HYDROGEN PEROXIDE * LACTOGLOBULINS * MILK * PROTEINS
IM MEDLARS TERMS	CASEIN * CATTLE * CHEMISTRY * ELECTROPHORESIS * HYDROGEN PEROXIDE * LACTOGLOBULINS * MERCAPTOETHANOL * MILK * PROTEINS * UREA
B OF A SEQUENCE NUMBER 27280	COMPARISON OF METHODS OF ANALYSIS FOR DETERMINATION OF FLUID FATTY ACIDS, WITH SPECIAL ATTENTION TO PROPIONIC ACID CONTENT
B OF A SECTION HEADING B OF A INDEX TERMS	AGRICULTURAL PRODUCTS * FEED AND FORAGE CROPS
B OF A INDEX TERMS	PROPIONIC ACID IN RUMEN * FATTY ACIDS IN SILAGE * RUMEN * PROPIONIC ACID IN SILAGE * SILAGE ANALYSIS * FATTY ACIDS IN RUMEN
IM INDEX TERMS	HORSE DISEASES/MICROBIOLOGY * VERTEBRATE VIRUSES, UNCLASSIFIED/ISOLATION * PURIFICATION
IM MEDLARS TERMS	ANIMAL EXPERIMENTS * ANTIBODY FORMATION * COLD * HORSE DISEASES/MICROBIOLOGY * INTERFERON/ANALYSIS * MICE * NEUTRALIZATION TESTS * TISSUE CULTURE * VERTEBRATE VIRUSES, UNCLASSIFIED/IMMUNOLOGY * VERTEBRATE VIRUSES, UNCLASSIFIED/ISOLATION * PURIFICATION * VIRAL VACCINES * VIRUS CULTIVATION
B OF A SEQUENCE NUMBER 27500	INHIBITION OF TOMATO PECTINESTERASE BY TANNIC ACID
B OF A SECTION HEADING B OF A INDEX TERMS	AGRICULTURAL PRODUCTS * FRUITS, VEGETABLES, AND NUTS * PROCESSING AND STORAGE
B OF A INDEX TERMS	TANNINS EFFECTS ON TOMATOES * PECTASE IN TOMATOES * TOMATOES PROCESSING * TOMATOES ENZYMES
IM INDEX TERMS	ESTERASES/METABOLISM * TANNINS/PHARMACODYNAMICS
IM MEDLARS TERMS	ENZYME INHIBITORS/PHARMACODYNAMICS * ESTERASES/METABOLISM * FRUIT * TANNINS/PHARMACODYNAMICS
B OF A SEQUENCE NUMBER 1780	INTRODUCTORY REMARKS, WITH SPECIAL REFERENCE TO MEAT.
B OF A SECTION HEADING B OF A INDEX TERMS	AGRICULTURAL PRODUCTS * LIVESTOCK AND LIVESTOCK PRODUCTS * ANALYSIS AND COMPOSITION
B OF A INDEX TERMS	MEAT MICROORGANISMS
IM INDEX TERMS	FLAVORING AGENTS * FOOD MICROBIOLOGY * MEAT
IM MEDLARS TERMS	FLAVORING AGENTS * FOOD MICROBIOLOGY * HUMAN * MEAT

Fig. 7b

Examples of Computer Printouts  
of Index Terms Contributed by  
B of A and Other Services  
to the Same Document

Examples of Computer Printouts  
of Index Terms Contributed by  
B o l A and Other Services  
to the Same Document



\* Shown in rank order in two places: for the published issues only, and for the service as a whole including the computer data bank.

Fig. 8

Relative Number of Subject Access Points Per Citation Provided by B of A and 13 Other Services for the Same Citations



Service	Size of Sample of Citations Indexed by Both B of A and and This Service	B OF A		OTHER SERVICE		Term Ratio (Total No. of Other Service's Terms ÷ Total No. of B of A Terms)
		Number of Index Terms Applied to These Citations	Average Number of Terms per Citation	Number of Index Terms Applied to These Citations	Average Number of Terms per Citation	
BA	752	2,889	3.84	7,111	9.46	2.46
B.A.S.I.C.				1,231	1.64	0.43
Biosystematic				5,158	6.86	1.79
CROSS				13,500	17.95	4.68
Total						
BAI	378	1,095	2.90	378	1.00 <sup>+</sup> *	—
CA	591	2,028	3.43	3,260	5.52	1.61
DSA	72	206	2.86	216	3.00 <sup>**</sup>	1.05
EI	29	60	2.07	29	1.00	.48
FA	Index terms unavailable for this study.					
HA	138	412	2.99	541	3.92	1.31
IM	306	937	3.06			
IM				956	3.12	1.02
MEDLARS (terms added to IM terms)				1,153	3.76	1.23
Total				2,109	6.89	2.25
IV	Index terms unavailable for this study.					
MGA	5	14	2.80	13	2.60	.93
PDB	897	3,214	3.58	5,359	5.97 *	1.67
PAIS	16	24	1.50	16	1.00 <sup>+</sup>	—
TTD	33	74	2.24			
Printed				55	1.67	.74
Computer				295	8.94	3.99
Total				350	10.61	4.73
TA	27	100	3.70	66	2.44	.66
WAERSA-old system	79	163	2.06	83	1.05	.51
WAERSA-new system***	79	163	2.06	83	1.05	.51

\* Citations may be listed under more than one access point, however for this study the searchers stopped looking after they found the first one.

\*\*EI by design only includes a citation under one subject heading.

\*\*\*WAERSA provided indexing for these citations as done by both the present system and their proposed new system.

Table VIII

Relative Number of Subject Access Points Per Citation Provided by B of A  
and 13 Other Secondary Services for the Same Citations



felt would be the most revealing was a comparison, on an article-by-article basis, of the terms that were actually applied to the same document by B of A and the other services. To our knowledge this had not been done to any extent in prior studies, although one recent article reviewed the indexing coverage given to four B of A citations by several services, and made some general statements in conclusion,\* and another study listed the index headings in B of A and other services under which a group of citations were found.\*\* It was our hope that a methodology could be developed by which some absolute and objective measures could be established to describe the degree and type of relationship between assigned indexing terms. To our knowledge, such measures or procedures had not been developed or suggested prior to this study.

Considerable effort was spent in planning and testing such a methodology to be used to describe the relationship of terms assigned by multiple services to the same document. Particular emphasis was placed on developing some normalized numeric measure that would: (1) have meaning independent of the sample size used or the particular services studied; (2) be repeatable by other experimenters; and (3) permit direct comparison of several services. Initial efforts were concentrated on developing such a procedure for a two-service situation, with the understanding that the procedure could be generalized to more than two indexing services if desired. Variation in technique was necessary to cover the wide difference between single- and multiple-term indexing. The developed measure is believed to be satisfactory, and yields results indicative of the relationship of the various indexing services studied. However, the difficulty in making objective and consistent judgments about subject terms is not to be underestimated. While consistency can be checked to some extent by duplication of efforts by several workers, objectivity cannot be assured without further studies of how the particular indexes are used.

#### b. The Relationship Matrix and Measure

The procedure finally adopted for this study involved the use of a relationship matrix which displayed, for a given citation, the subject index terms applied to it by B of A and one other service. Examples of such matrix worksheets and the index terms provided by several services are shown in Figs. 9a-h. Using the indexing information arranged on such worksheets, a research analyst worked on one citation at a time to: (1) compare each term of one service against each of the other terms assigned by the second service; (2) make a judgment of the degree of association (e.g., terms not judged to be

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\* Bystrom, Marcia. "Agricultural Information: Can You Find It With the Index?" Special Libraries, v. 59, no. 9, November 1968, pp. 712-717.

\*\*Martyn, J. and M. Slater. "Tests on Abstract Journals," Journal of Documentation, v. 22, no. 4, December 1964, pp. 212-235; v. 23, no. 1, March 1967, pp. 45-70

B of A No. 460

BA

B of A

	ECONOMY	FRUIT	PRODUCTION	COSTS	RETURNS	COOPERATION	SPAIN	BOOK	(NONE)	HORTICULTURE - GEN			
FRUIT, COSTS, SPAIN	II	Ib	III	IIa	III	III	IIa	III		II3			
FRUIT, RETURNS, SPAIN	II	Ib	III	III	IIa	III	IIa	III		II3			
FRUIT, COOPERATIVES, SPAIN	II	Ib	III	III	III	IIa	IIa	III		II3			
COOPERATIVE ORGANIZATIONS, FRUIT, SPAIN	II	IIa	III	III	III	Ib	IIa	III		II3			
BIBLIOGRAPHICS, FRUIT RETURNS	II	IIa	III	III	IIa	III	III	IIa		II3			
BIBLIOGRAPHICS, FRUIT COOPERATIVES	II	IIa	III	III	III	IIa	III	IIa		II3			

Fig. 9a

Examples of Relationship Matrix Worksheets

Number of index terms:

B of A 6  
Other service 8  
C 1

Relationships:

I a 0  
b 4  
II a 12  
b  
c  
d  
e 2  
f  
g  
h  
i 6

I 1  
2  
3  
4  
5  
6  
II 1  
2  
3  
4  
5  
6

III 22  
IV  
TOTAL: 48

BASIC

Library

CRUISS

BASIC

BIC

CRUISS

DSA

Fig. 9b

Examples of Relationship  
Matrix Worksheets

58

PDB

B of A

УЛЕЭЭХ

## SPIDERS

EXCRETION

 $\pi a$ 

Tb

EXCRETA,  
SPIDERS

IL

IIa

Fig. 9c

## Examples of Relationship Matrix Worksheets

Number of index terms:

B of A	2
Other service	2

**Relationships:**

I	a	I	1
	b		2
II	a		3
	b		4
	c		5
	d		6
	e	II	1
	f		2
	g		3
	h		4
	i		5
			6

I	1
	2
	3
	4
	5
	6
II	1
	2
	3
	4
	5
	6

### III

IV

TOTAL: 4

TTD

B of A

1. COOL-YELLOWING,  
 2. SUNLIGHT, SURFACE  
 FOR INHIBITORS  
 3. PHOTOCHEMICAL DEGRADATION - COOL YELLOWING,  
 INHIBITION STUDY  
 4. TEXTILE RESEARCH J.  
 5. YELLOWING  
 6. WOOD  
 7. EXPERIMENTAL  
 8. RETARDANTS  
 9. PADDING  
 10. FIBRICS  
 11. PHOTOCHEMICAL  
 DEGRADATION  
 12. SUNLIGHT  
 13. LIGHT  
 14. COMPARISONS  
 15. VISUAL  
 EVALUATION  
 16. COLOR  
 MEASUREMENT  
 17. REFLECTANCE

## UVR RADIATION, EFFECTS ON WOOL

DISCUSSION

[illegible]

## Examples of Relationship Matrix Worksheets

Relationships:

B of A	.2
Other service	2
	14

I	a	
	b	1
II	a	1
	b	
	c	
	d	1
	e	4
	f	
	g	
	h	
	i	2

I	1
	2
	3
	4
	5
	6
II	1
	2
	3
	4
	5
	6

### III

19

IV

TOTAL:	41	.28
--------	----	-----

CA

B of A

CARROTS - CALLUS  
INITIATION FROM  
TAPROOT OF  
TISSUE, PLANT-PITLOEM,  
CALLUS INITIATION  
FROM CARROT TAPROOT

PHLEEM,  
CARROTS

$$\text{II } 6 \quad \text{II } 2$$

CARROTS,  
CYTOLOGY

I2	II2
----	-----

CALLUS,  
CARROTS

II 2	II 2
------	------

## TISSUE CULTURE, CARROTS

$$\Pi_6 \mid I_2$$

## Examples of Relationship Matrix Worksheets

Number of index terms:	Relationships:
B of A 4	I a I 1 III
Other service 2	b 2 2
	II a 3 IV
	b 4
	c 5 TOTAL: 8
	d 6
	e II 1
	f 2 11
	g 3
	4
	5
	6 2

HA

**E of A**

## BEANS, CONTAMINATION

CHROMATOGRAPHIC  
METHODS IN RESIDUE  
ANALYSIS IN CRIPS

INSECTICIDES,  
RESIDUES and their  
ANALYSIS

BEAN (PHASEOLUS),  
SPRAY RESIDUES AND  
OTHER CHEMICAL  
RESIDUES AND  
RETENTION.

Fig. 9f

## Examples of Relationship Matrix Worksheets

Number of index terms:		Relationships:	
B of A	4	I a	I 1
Other service	3	b	2
		II a	3
		b	4
		c	5
		d	6
		e	II 1
		f	2
		g	3
		h	4
		i	5
		j	6
			TOTAL: 12





TA

**B of A**

etc tobacco,  
biochemistry

Nicotinamide  
Adenine Nicotinide  
Nicotine precursor

Nicotinamide  
nicotinamide adenine  
dinucleotide

## Ricine Biosynthesis

routine, in  
dike tobacco

 $\pi_6$ 

II 2

Π

cytosine nucleotides in  
7-10 tobacco

15

I4

IV

**Fig. 9h**  
**Examples of Relationship**  
**Matrix Worksheets**

Aztec tobacco = *Nicotiana rustica*

Number of index terms:

B of A

Other service 3

**Relationships:**

I a

b

II a

b

**C**

d

e

**f**

g

61

i

I 1

22

3

41

51

5

II i

21

3

4

5

64

III 3

IV

TOTAL: 9

alphabetically identical) for each of the term pairs; and (3) annotate the matrix for the corresponding term-pair. A list of possible types of meaningful term pair associations was developed and used for this purpose in order to ensure rigor and consistency in the judgments and identification of term associations. Much of the judging was done by research analysts who had a general knowledge of the subjects. Another research analyst, a librarian who was even more familiar with classification and indexing techniques, reviewed all of the judgments and made some additional ones.

The types of term-pair relationships and associations that were defined and used in this study depended somewhat on the type of indexing performed by the particular service being studied. For example, some types of relationships were possible with hierarchical systems that had no counterparts in coordinate or keyword indexing systems and vice versa. For this reason, two separate lists of possible relationships were established for use by the research analysts: one for services with single term index entries, and one for services with multiple term or hierarchical index entries. The first list (for indexes with single-term entries) was used on comparing BA B.A.S.I.C. and Biosystematic indexes, DSA, PDB, and TTD computer index terms with B of A. (As printed, the BA Biosystematic index and DSA's subject index contain multiple term entries, but only single terms were supplied by the services to IGC.) The second list was used in comparing BA CROSS index, BAI, CA, EI section headings, HA, IM MEDLARS, MGA, PAIS, TA, TTD printed index, and WAERSA index terms with B of A.

After analysis using these two separate lists, a combined or composite list was created, as shown in Table IX, to show all possible relationships noted in the analysis of both types of index terms.

The variations allowed in the determination of alphabetical identity are listed in Table X.

In the transcription of hierarchical index terms, commas, hyphens, and slashes were all used by the various services to denote different hierarchical levels. These punctuation marks were also ignored in this analysis.

### c. Sample Size

At least twenty documents with joint indexing (i.e., documents indexed by both B of A and one of the other services) were studied for each service unless that number of documents was unavailable. The specific documents in the sample of twenty were selected by a uniform sampling of the available population of jointly indexed documents (e.g., every 15th IM citation of the jointly-indexed population was selected). It was felt that this sample size would provide a good test of the procedure, as well as a relatively stable estimate of the measure of relationship. A total of 305 instances of documents with joint indexing are still available in the data base for further study in this manner by IGC at a later date.

- I. Same alpha entry, with allowable variations
  - . Whole term identical, with allowable variations (Ia II)
  - . B of A more general; other service has more terms, or more specific terms following alpha entry (I2)
  - . B of A more specific; B of A has more terms, or more specific terms following alpha entry (Ib I3)
  - . Equal level of indexing
    - : Terms following alpha entry are synonymous (I4)
    - : Terms following alpha entry are not synonymous (I5)
  - . Relationship of terms following alpha entry is not ascribable to above categories (I6)
- II. Different alpha entry; concept of alpha entry related to a concept in terms of contrasted service
  - . B of A more general; other service more specific (IIIf II2)
  - . B of A more specific; other service more general (IIi II3)
    - : Single word or term of other service is identical with a term following the B of A alpha entry term (IIa)
    - : Single word or term of other service is synonymous with a term following the B of A alpha entry term (IIc)
    - : Single word or term of other service is synonymous with first word of B of A term; B of A has succeeding term(s) IIId)
  - . Equal level of indexing
    - : Terms are synonymous (IIb II4)
    - : Terms are inverted (IIl)
    - : Terms are not synonymous (II5)

Table IX

Classes of Relationships Noted in Comparing Index Terms Assigned by Two Services to the Same Document

Relationship of terms is not ascribable to above categories (IIe II6)

: Single word or term of other service is a subset of a  
term following the B of A alpha entry term (II g)

: Single word or term of other service is a subset of the  
first word of B of A term; B of A has succeeding term(s) (IIh)

III. No relation between two particular terms

IV Relation undetermined because outside subject competence of analyst

Table IX (Concluded)

Classes of Relationships Noted in Comparing Index Terms Assigned by Two  
Services to the Same Document

**Variant spellings of the same word**

gray vs grey

color vs colour

litchee vs lychee

**Word plurals**

nut vs nuts

**Word form**

package vs packaging

vibrio vs vibrionic

arachnids vs arachnida

**Punctuation and special characters**

sub-tropical vs subtropical

leaf, diseases vs leaf diseases

**Articles**

vines and nuts vs vines, nuts

fleas in fruit vs fleas, fruit

**Abbreviations**

lawns, etc., diseases vs lawns, diseases

pereskiopsis vs pereskiopsis spp.

US vs United States

**Table X**

**Variations Allowed in Determining Identical Index Terms Assigned by**

**Two Services to the Same Document**

#### d. Source Data

The original working documents used to provide the source data for this part of the study were the series of computer printouts of the citations jointly indexed by B of A and the other services. A few examples of such printouts were shown in Fig. 7a-d.

### 2. Findings

#### a. Services With Single Term Index Entries

The detailed analysis of the index terms applied by two services to the same document, using the relationships listed earlier in Table IX, yielded the data illustrated in Figs. 10a-c, and summarized in Table XI. These data are given in terms of numbers and percentages of the possible term-pair relationships (i.e., each term of B of A compared with each term supplied by the other service for the same document) that were of each of the four types described in Table IX. These data lead to the following specific observations for the comparison of B of A with the BA B.A.S.I.C. and Biosystematic indexes, the indexes for DSA and PDB, and the TTD computer index:

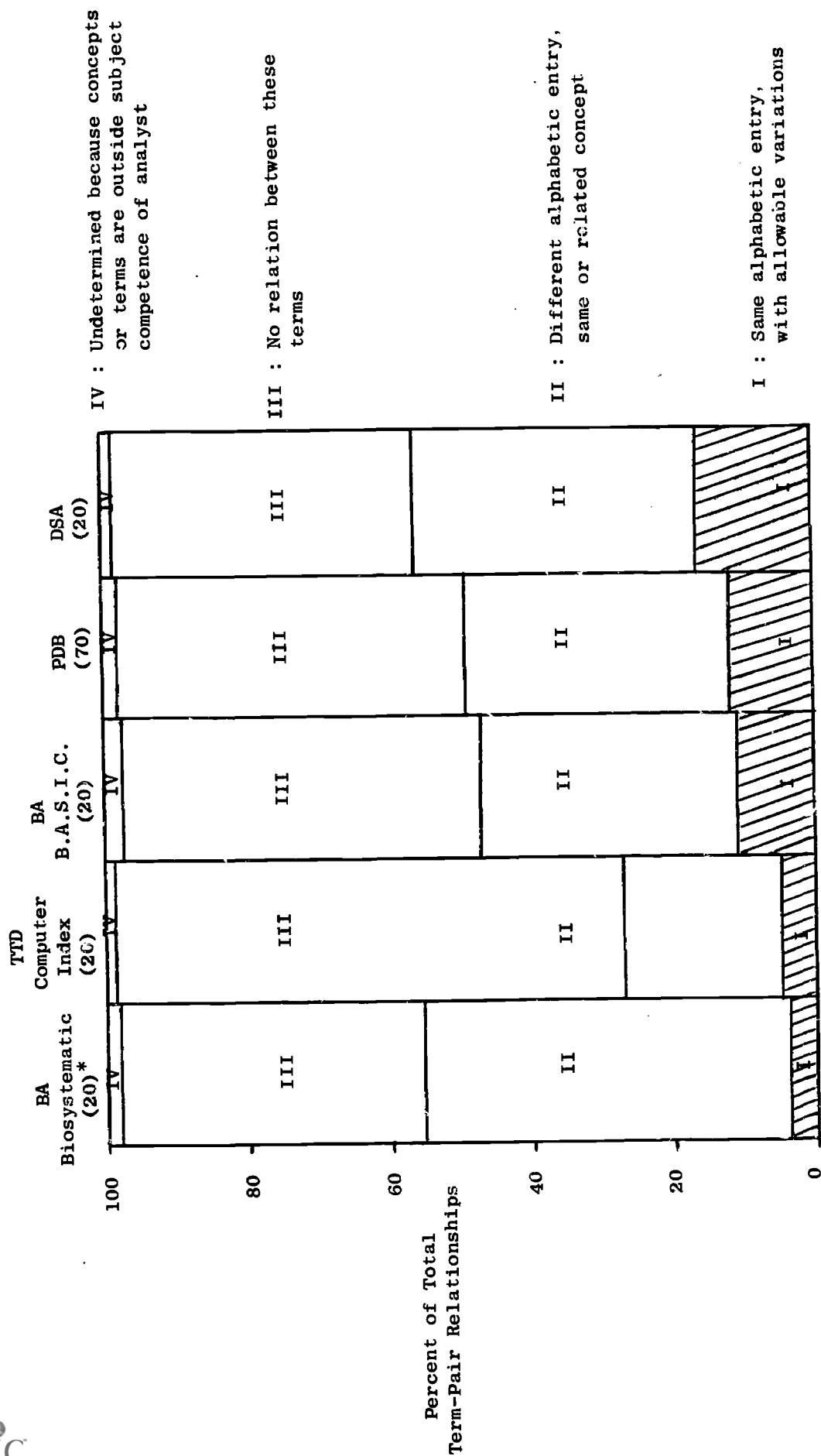
Depending on the service, 4 to 16 percent of the term-pairs studied were entered under alphabetically identical terms, i.e., the first word of B of A's term was alphabetically identical to the single term used by the other service, assuming the allowable variations of the types noted in Table X. An average of 10 percent of all the term-pairs analyzed for each of the services had the same alphabetic entry in this way. An average of only one half of the one percent of all the term-pairs were completely identical, i.e., B of A used an identical single term index entry, with no terms following the entry term. (See Fig. 10a and Type I relationships in Table XI).

From 28 to 36 percent of the term-pairs studied were of the same or related concepts. An average of 46 percent of all of the term-pairs analyzed for each of these services were of the same or related concepts. (See Fig. 10b)

From 43 to 71 percent of the term-pairs studied were unrelated in concept. An average of 52 percent of all of the term-pairs analyzed for each of these services were unrelated in concept. (See Fig. 10c)

#### b. Services With Multiple or Hierarchical Term Index Entries

The term-pairs for these services were analyzed in the same manner as done for the single-term services described in the previous section.

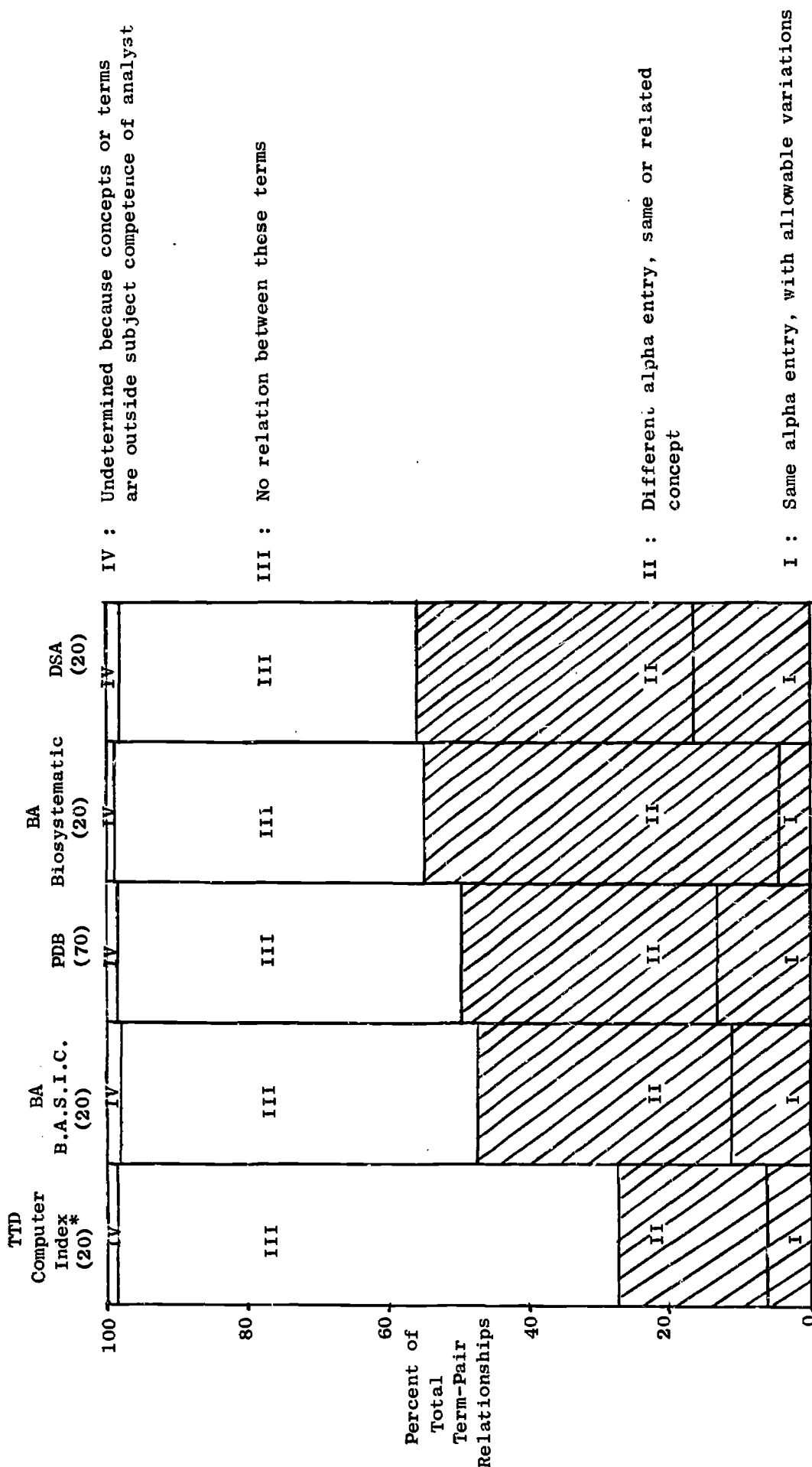


Ranked by increasing percent of Class I (same alphabetic entry) relationships

\* The numbers in parentheses refer to the number of citations sampled from the file of jointly-covered citations, and used for this analysis.

Fig. 10a

Index Term Relationships Observed in Citations Indexed Jointly by B of A and Other Services That Use Single Term Index Entries



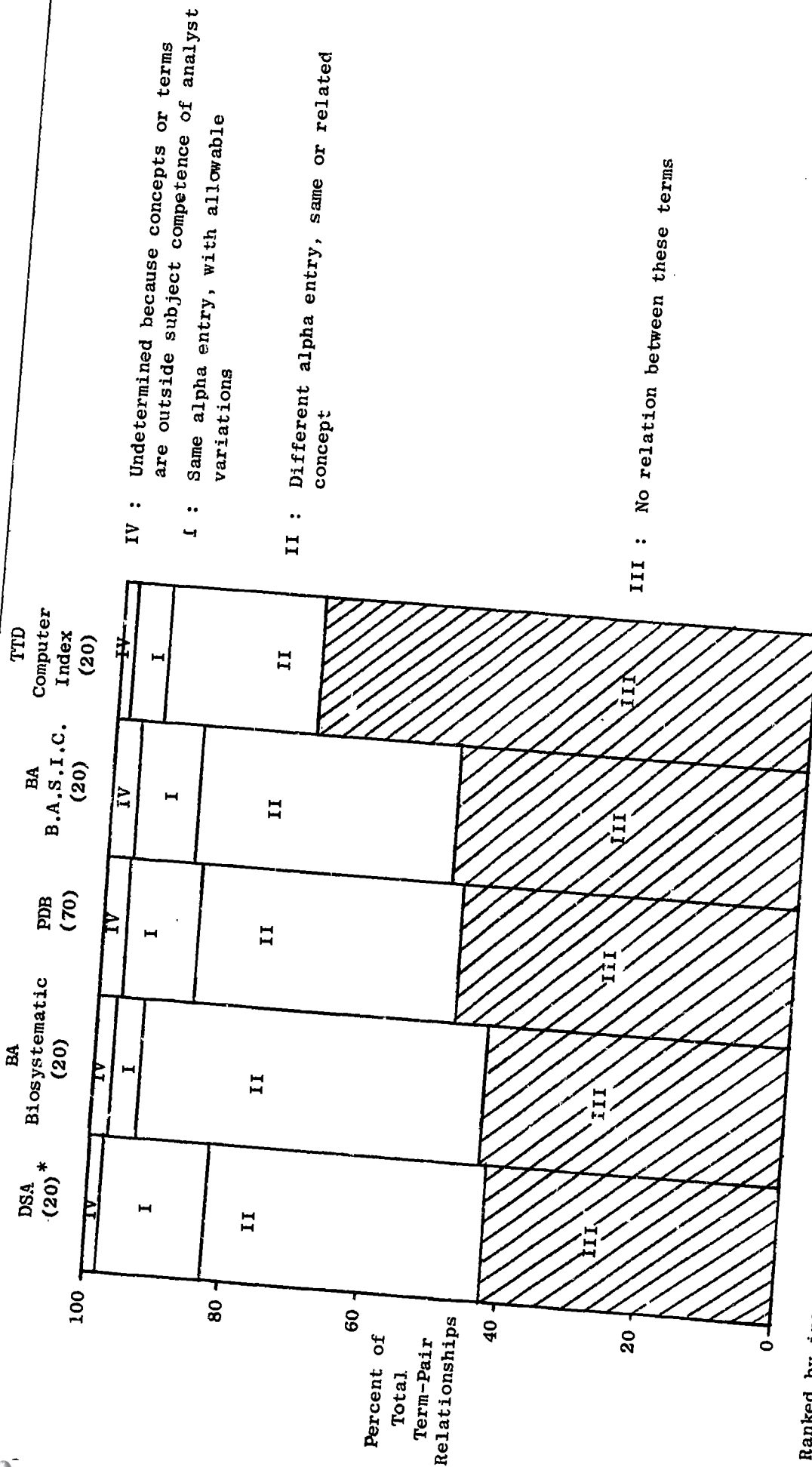
Ranked by increasing percent of related terms (class I and class II)

\* The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations, and used for this analysis.

Fig. 10b

Index Term Relationships Observed in Citations Indexed Jointly by B of A and Other Services That Use Single Term Index Entries





Ranked by increasing percent of class III: no relation between terms  
\* The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations, and used for this analysis.

Fig. 10c

Index Term Relationships Observed in Citations Indexed Jointly by B of A and Other Services That Use Single Term Index Entries

Type of Relationship	BA		BA		Biosystematic (20)		DSA (20)		PDB (70)		TTD (20)		Computer Index		Combined Data	
	B.A.S.I.C. (20)*		BA		Biosystematic (20)		DSA (20)		PDB (70)		TTD (20)		Computer Index		Combined Data	
	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total
I. Same alpha entry, with allowable variations	53	10.82	4	3.74	28	15.91	166	11.95	21	4.95	272	10.52				
a. Identical, with allowable variations	-		-		1		10		3		14	0.54				
b. B of A more specific	53		4		27		156		18		258	9.98				
II. Different alpha entry, same or related concept	180	36.73	55	51.40	70	39.77	518	37.29	96	22.64	919	35.54				
a. Other term identical with term after B of A entry	50		3		19		171		14		257	9.94				
b. Other term synonymous with whole B of A term	-		-		5		2		1		8	0.31				
c. Other term synonymous with term after B of A entry	12		7		2		11		2		34	1.32				
d. Other term synonymous with B of A entry term	8		1		1		58		5		73	2.82				
e. Relationship not ascribable to other categories	58		2		13		138		36		247	9.55				
f. Other term more specific than B of A term	-		-		1		2		2		3	0.12				
g. Other term a subset of term after B of A entry	14		2		11		37		3		67	2.59				
h. Other term a subset of B of A entry term	7		1		17		41		30		96	3.71				
i. Whole B of A term more specific than other term	31		39		1		58		5		134	5.18				
III. No relation between these terms	244	49.79	46	42.99	75	42.61	674	48.52	301	70.99	1,340	51.82				
IV. Undetermined because concepts or terms are outside subject competence of analyst	13	2.66	2	1.87	3	1.71	31	2.24	6	1.42	55	2.12				
Total:	490	100.00	107	100.00	176	100.00	1,389	100.00	424	100.00	2,586	100.00				

\* The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations and used in this analysis.

Table XI  
Index Term Relationships Observed in Citations Indexed Jointly by B of A and Other Services That Use Single Term Index Entries

The resulting data are illustrated in Figs. 11a-c, and summarized in Table XII. These data led to the following specific observations for the comparison of B of A with the indexes for BAI, CA, EI, HA, MGA, PAIS, TA, the BA CROSS index, the TTD printed index, WAERSA's old and new indexing systems; and IM MEDLARS\* terms:

Depending on the service, 0 to 37 percent of the term-pairs studied were entered under alphabetically identical terms, i.e., at least the entry words of both terms in a pair were alphabetically identical, assuming the allowable variations of the types noted in Table X. An average of 13 percent of all the term-pairs analyzed for these services had the same alphabetic entry. An average of only one half of one percent of all the term-pairs were completely identical, i.e., not only the entry word but also all the terms following it were alphabetically identical. (See Fig. 11a and Type I relationships in Table XII)

From 44 to 98 percent of the term-pairs studied were of the same or related concepts. An average of 66 percent of all of the term-pairs analyzed for each of these services were of the same or related concepts. (See Fig. 11b)

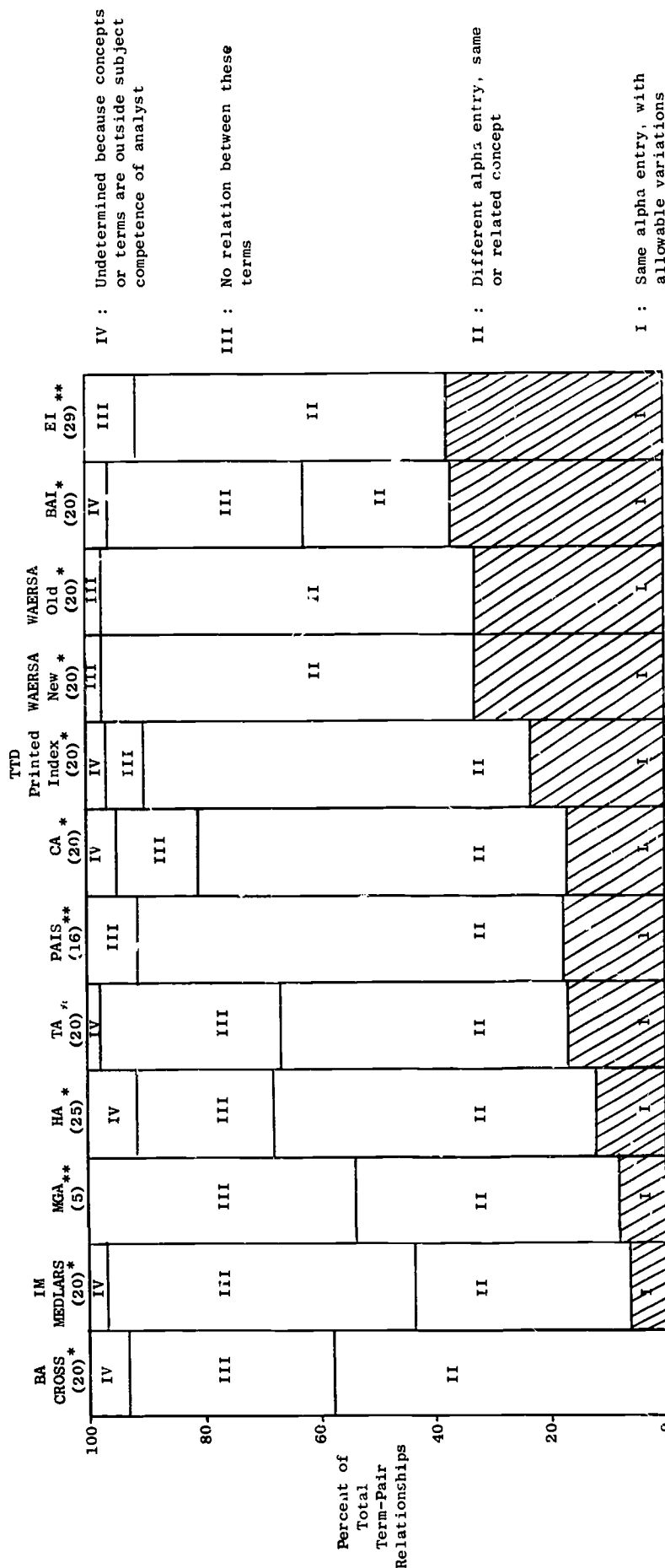
From 2 to 54 percent of the term-pairs studied were unrelated in concept. An average of 30 percent of all of the term-pairs analyzed for each of the services were unrelated in concept. (See Fig. 11c)

#### c. Combined Data

A composite summary of the term-pair data for all of the services is given in Fig. 12.

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\* In this section, "IM MEDLARS" refers to the total number of terms supplied by NLM, with no distinction as to which terms appeared in the printed IM.



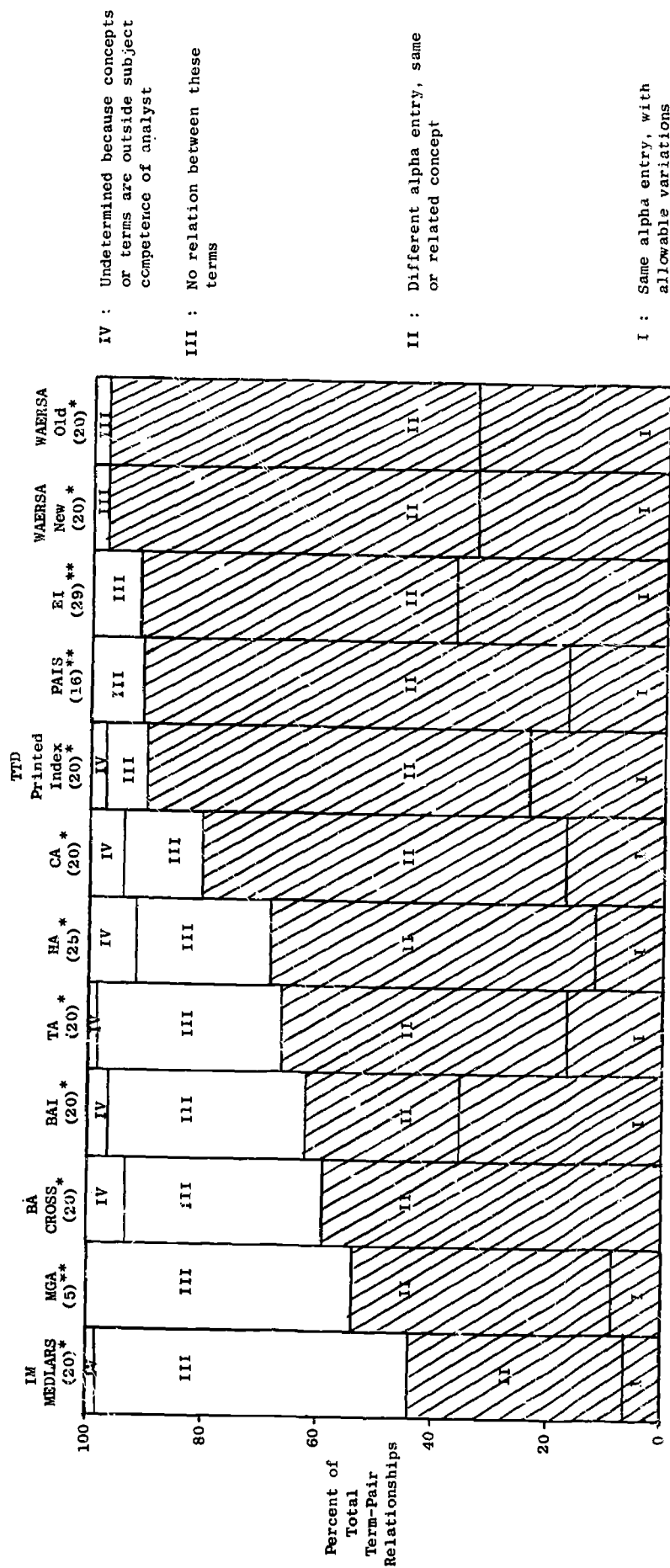
Ranked by increasing percent of class I (same alpha entry) relationships

\* The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations, and used for this analysis.

\*\* The numbers in parentheses refer to the total number of jointly covered citations available in the file, and used for this analysis.

Fig. 11a

Index Term Relationships Observed in Citations Indexed Jointly by B of A and Other Services That Use Hierarchical or Multiple Term Index Entries



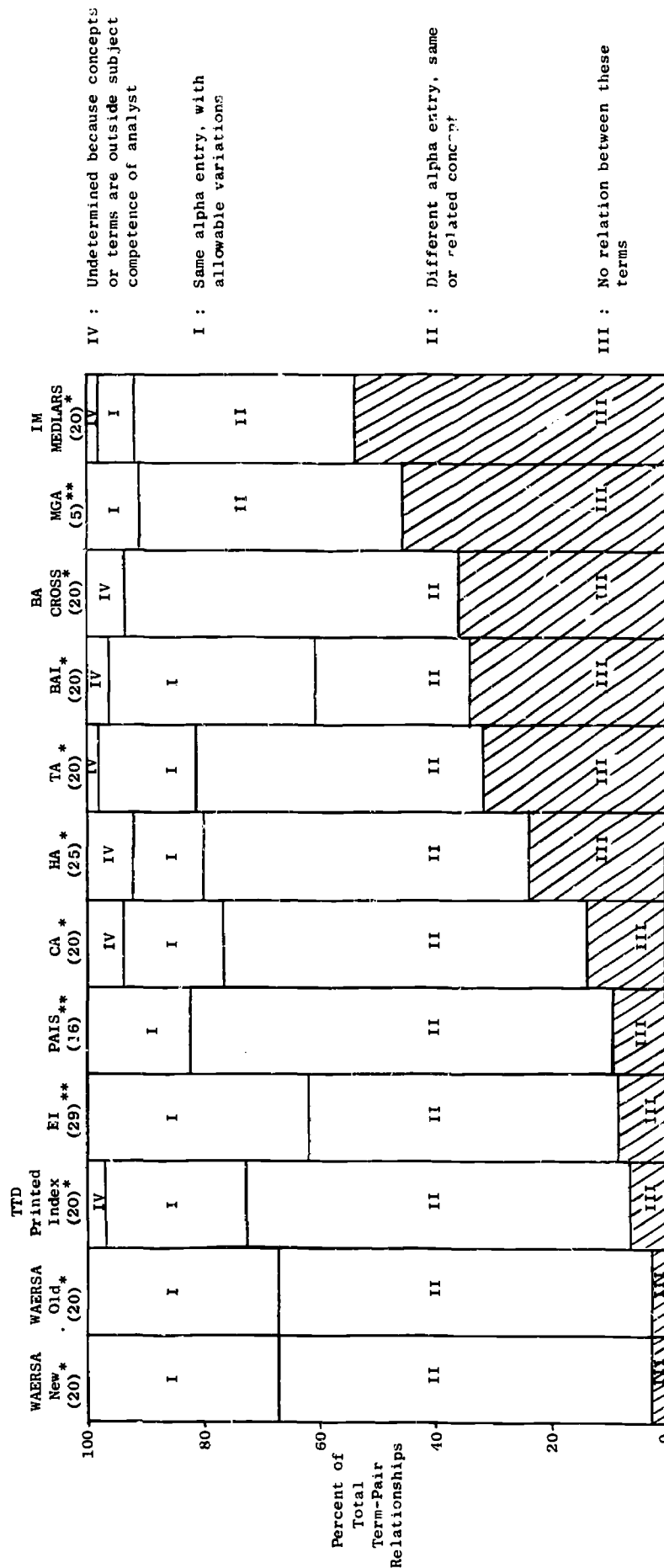
Ranked by increasing percent of related terms (class I and class II)

\* The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations, and used for this analysis.

\*\* The numbers in parentheses refer to the total number of jointly covered citations available in the file, and used for this analysis.

Fig. 11b

Index Term Relationships Observed in Citations Indexed Jointly by B of A and Other Services That Use Hierarchical or Multiple Term Index Entries



Ranked by increasing percent of class III: no relation between terms

\* The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations, and used for this analysis.

\*\* The numbers in parentheses refer to the total number of jointly covered citations available in the file, and used for this analysis.

Fig. 11c

Index Term Relationships Observed in Citations Indexed Jointly by B of A and Other Services That Use Hierarchical or Multiple Term Index Entries

Type of Relationship	BA CROSS* (20)		BAI* (20)		CA* (20)	
	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences
I. Same alpha entry, with allowable variations	-	-	20	35.71	39	17.81
1. Identical, with allowable variations	-	-	3	-	-	-
2. B of A more general	-	-	1	-	32	-
3. B of A more specific	-	-	13	-	-	-
4. Terms after entry are synonymous	-	-	-	-	-	-
5. Terms after entry are not synonymous	-	-	2	-	2	-
6. Not ascribable to above categories	-	-	1	-	5	-
II. Different alpha entry, same or related concept	210	58.82	15	26.79	137	62.56
1. Terms are inverted	-	-	1	-	0	-
2. B of A more general	1	-	1	-	82	-
3. B of A more specific	100	-	4	-	5	-
4. Equal level of indexing, synonymous	1	-	1	-	1	-
5. Equal level of indexing, not synonymous	8	-	4	-	15	-
6. Not ascribable to above categories	100	-	4	-	34	-
III. No relation between those terms	125	35.02	19	33.93	32	14.61
IV. Undetermined because concepts or terms are outside subject competence of analyst	22	6.16	2	3.57	11	5.02
Total:	357	100.00	56	100.00	219	100.00

\* The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations and used in this analysis.

Table XII  
Index Term Relationships Observed in Citations Indexed Jointly by B of A and  
Other Services That Use Hierarchical or Multiple Term Index Entries

Type of Relationship	EI ** (29)		HA * (25)		IM MEDLARS (26) *		MGA ** (5)		PAIS ** (16)	
	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences
I.	22	37.29	46	12.30	22	6.51	3	8.58	4	17.39
1.	2		1		1		-		-	
2.	1		18		2		1		-	
3.	11		3		10		-		1	
4.	2		2		-		-		1	
5.	5		12		8		2		2	
6.	1		4		1		-		-	
II.	32	54.24	209	55.88	127	37.57	16	45.71	17	73.91
1.	2		1		-		-		3	
2.	1		46		2		2		1	
3.	13		41		68		3		3	
4.	1		1		-		-		1	
5.	10		63		34		4		4	
6.	5		57		23		7		5	
III.	5	8.47	91	24.33	183	54.14	16	45.71	2	8.70
IV.	-	-	28	7.49	6	1.78	-	-	-	-
Total:	59	100.00	374	100.00	338	100.00	35	100.00	23	100.00

\* The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations and used in this analysis.

\*\* The numbers in parentheses refer to the total number of jointly covered citations available in the file and used for this analysis.

Table XII (continued)

Index Term Relationships Observed in Citations Indexed Jointly by B of A and  
Other Services That Use Hierarchical or Multiple Term Index Entries

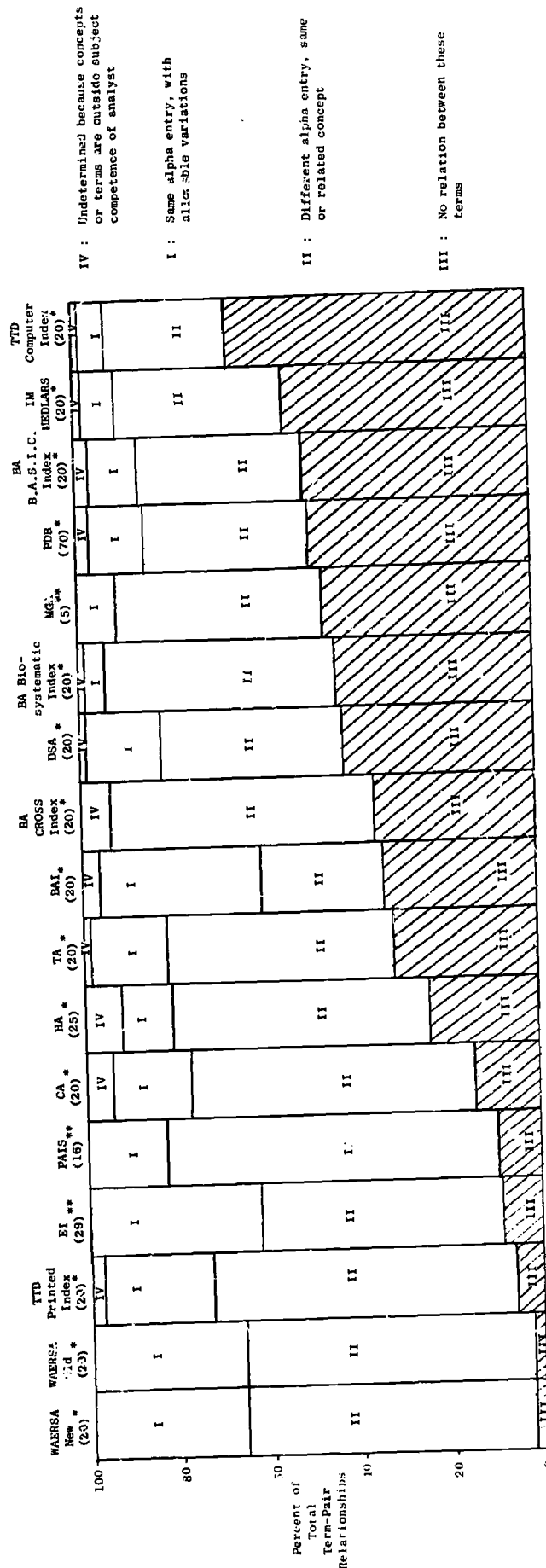


Type of Relationship	TTD Printed Index (20)*		TA * (20)		WAERSA New System (20)*		WAERSA Old System (20)*		Combined Data	
	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences	Number of Occurrences	Percent of Total Occurrences
I.	18	23.68	38	17.12	15	33.33	15	33.33	242	13.09
1.	-	-	-	-	1	-	2	-	10	0.54
2.	9	-	20	-	3	-	2	-	89	4.81
3.	-	-	4	-	2	-	2	-	52	2.81
4.	1	-	1	-	-	-	-	-	7	0.38
5.	3	-	7	-	6	-	6	-	55	2.98
6.	5	-	6	-	3	-	3	-	29	1.57
II.	51	67.10	109	49.09	29	64.45	29	64.45	981	53.05
1.	-	-	-	-	1	-	-	-	8	0.43
2.	43	-	45	-	6	-	7	-	237	12.81
3.	-	-	5	-	5	-	5	-	252	13.63
4.	1	-	-	-	-	-	-	-	7	0.38
5.	-	-	12	-	3	-	6	-	166	8.98
6.	7	-	47	-	11	-	11	-	311	16.82
III.	5	6.58	71	31.98	1	2.22	1	2.22	551	29.80
IV.	2	2.54	4	1.81	-	-	-	-	75	4.06
Total:	76	100.00	222	100.00	45	100.00	45	100.00	1,849	100.00

\*The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations and used in this analysis.

\*\*The numbers in parentheses refer to the total number of jointly covered citations available in the file and used for this analysis.

Table XII (concluded)  
Index Term Relationships Observed in Citations Indexed Jointly by B of A and  
Other Services That Use Hierarchical or Multiple Term Index Entries



Ranked by increasing percent of class III: no relation between terms.  
 \* The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations, and used for this analysis.  
 \*\* The numbers in parentheses refer to the total number of jointly covered citations available in the file, and used for this analysis.

Fig. 12  
 Index Term Relationships Observed in Citations Indexed Jointly by B of A and 13 Other Services

### 3. Estimate of Measurement Error

As mentioned earlier, the comparison on an article-by-article basis of all possible combinations of index terms supplied by two services required a considerable amount of time. For that reason, the sample size for this analysis was kept relatively small, generally 20 citations if this number was available. However, in order to determine how sensitive the estimates of term relationship type percentages were to the sample size used, several estimates were made from increasingly larger sample sizes. PDB was the single-term service studied in this way. BAI, IM MEDLARS, and WAERSA were the multiple-term services studied in this way.

The estimates of percentage of types of term-pair relationships that were obtained with increasing sample sizes for single-term and multiple-term services are given in Tables XIII and XIV respectively. In general, this data indicates that an absolute variation of about  $\pm 5$  percent might be added to the percentage values determined earlier for each of the types of term-pair relationships, because of the smaller samples sizes actually used in this analysis.\* This would not appear to significantly change the findings obtained with these samples, and reported in the previous section.

### 4. Unique Subject Access Points

A separate analysis was made of the index terms applied to the same sample of citations. In this analysis, each term was examined with respect to all of the terms supplied by the other service for that citation, instead of looking simply at pairs of terms. A judgment was then made as to whether a particular entry term was different in concept from all terms of the other service. A further distinction was made as to whether or not terms following the entry bore a relation to terms of the contrasted service. This analysis yielded a number representing the unique subject access points provided for a citation by B of A and a number representing the unique access points provided for the same citation by the other service. These numbers were totalled for B of A and for each other service. The totals were then combined to get a grand total of unique subject access points provided for that set of citations, together with percentages representing the contribution of B of A and of each of the other services to this grand total. These data are illustrated in Fig. 13 and given in detail in Table XV.

Of the services which, like B of A, provided multiple term indexing, CA provided the largest percent of unique subject access

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\* This would probably be a smaller figure, say  $\pm 2$  percent, for the estimate of the percent of term-pair relationships that have the same alphabetic entry.

Type of Relationship	PDB (20)*		PDB (50)		PDB (70)		PDB (80)**		Absolute Percentage Difference Between PDB (20) and PDB (70)
	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	
I. Same alpha entry. with allowable variations	51	11.28	115	12.27	166	11.95	172	14.22	
a. Identical, with allowable variations	2		8		10		11		
b. B of A more specific	49		107		156		161		
II. Different alpha entry, same or related concept	191	42.26	327	34.90	518	37.29	485	40.08	
a. Other term identical with term after B of A entry	56		115		171		140		
b. Other term synonymous with whole B of A term	1		1		2		5		
c. Other term synonymous with term after B of A entry	6		5		11		17		
d. Other term synonymous with B of A entry term	38		20		58		9		
e. Relationship not ascribable to other categories	49		89		138		207		
f. Other term more specific than B of A term	1		1		2		-		
g. Other term a subset of term after B of A entry	11		26		37		17		
h. Other term a subset of B of A entry term	11		30		41		30		
i. Whole B of A term more specific than other term	18		40		58		60		
III. No relation between these terms	194	42.92	480	51.23	674	48.33	529	43.72	
IV. Undetermined because concepts or terms are outside subject competence of analyst	16	3.54	15	1.60	31	2.23	24	1.98	
	452	100.00	937	100.00	1,389	100.00	1,210	100.00	

\*The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations and used in this analysis.

\*\*Uniform samples of 20 and 50 citations were used for this study, then combined to make total file of 70. An independent sample of 80 citations was drawn largely from the first few B of A sections.

Table XIII

Effect of Sample Size on Determination of Value of Index Term Relationships Observed in Citations Indexed Jointly by B of A and Another Service (PDB) That Uses Single Term Index Entries

Type of Relationship	BAI (15)*		BAI (20)		Absolute Percentage Difference Between BAI (15) and BAI (20)
	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	
I. Same alpha entry, with allowable variations	15	38.46	20	35.71	- 2.75
1. Identical, with allowable variations	2		3		
2. B of A more general	1		1		
3. B of A more specific	10		13		
4. Terms after entry are synonymous	-		-		
5. Terms after entry are not synonymous	1		2		
6. Not ascribable to above categories	1		1		
II. Different alpha entry, same or related concept	11	28.21	15	26.79	- 1.42
1. Terms are inverted	1		1		
2. B of A more general	1		1		
3. B of A more specific	2		4		
4. Equal level of indexing, synonymous	1		1		
5. Equal level of indexing, not synonymous	4		4		
6. Not ascribable to above categories	2		4		
III. No relation between these terms	11	28.21	19	33.93	+ 5.72
IV. Undetermined because concepts or terms are outside subject competence of analyst	2	5.12	2	3.57	- 1.55
	39	100.00	56	100.00	

\*The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations, and used in this analysis.

Table XIV

Effect of Sample Size on Determination of Value of Index Term Relationships Observed  
in Citations Indexed Jointly by B of A and Other Services That Use Hierarchical or Multiple Term Index Entries

Type of Relationship

	IM MEDLARS (15)		IM MEDLARS (20)		Absolute Percentage Difference Between IM MEDLARS (15) and IM MEDLARS (20)
	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	
I. Same alpha entry, with allowable variations	18	7.53	22	6.51	- 1.02
1. Identical, with allowable variations	1		1		
2. B of A more general	2		2		
3. B of A more specific	9		10		
4. Terms after entry are synonymous	-		-		
5. Terms after entry are not synonymous	6		8		
6. Not ascribable to above categories	-		1		
II. Different alpha entry, same or related concept	97	40.58	127	37.57	- 3.01
1. Terms are inverted	-		-		
2. B of A more general	1		2		
3. B of A more specific	53		68		
4. Equal level of indexing, synonymous	-		-		
5. Equal level of indexing, not synonymous	21		34		
6. Not ascribable to above categories	22		23		
III. No relation between these terms	118	49.37	183	54.14	+ 4.77
IV. Undetermined because concepts or terms are outside subject competence of analyst	6	2.52	6	1.78	- .74
	<u>239</u>	<u>100.00</u>	<u>338</u>	<u>100.00</u>	

\*The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations, and used in this analysis.

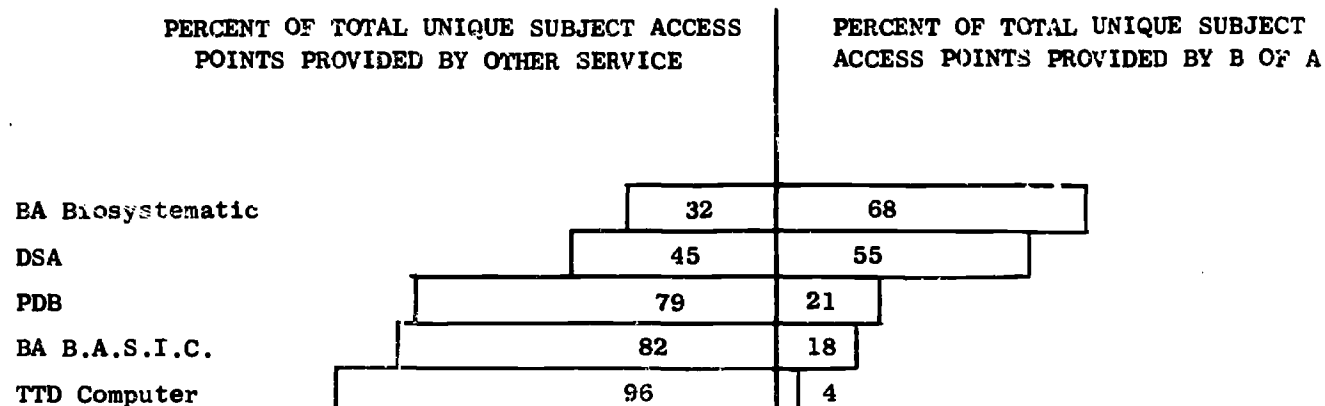
Table XIV (continued)

Effect of Sample Size on Determination of Value of Index Term Relationships Observed  
in Citations Indexed Jointly by B of A and Other Services That Use Hierarchical or Multiple Term Index Entries

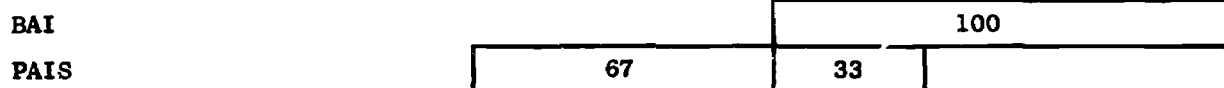
Type of Relationship	WAERSA-old (15)		WAERSA-old (20)		Absolute Percentage Difference Between WAERSA-old (15) and WAERSA-old (20)
	Total No. of Occurrences	% of Total	Total No. of Occurrences	% of Total	
I. Same alpha entry, with allowable variations	9	29.03	15	33.33	+ 4.30
1. Identical, with allowable variations	2		2		
2. B of A more general	2		2		
3. B of A more specific	2		2		
4. Terms after entry are synonymous	-		-		
5. Terms after entry are not synonymous	2		6		
6. Not ascribable to above categories	1		3		
II. Different alpha entry, same or related concept	21	67.74	29	64.45	- 3.29
1. Terms are inverted	-		-		
2. B of A more general	6		7		
3. B of A more specific	4		5		
4. Equal level of indexing, synonymous	-		-		
5. Equal level of indexing, not synonymous	6		6		
6. Not ascribable to above categories	5		11		
III. No relation between these terms	1	3.23	1	2.22	- 1.01
IV. Undetermined because concepts or terms are outside subject competence of analyst	-	-	-	-	-
	31	100.00	45	100.00	

\*The numbers in parentheses refer to the number of citations sampled from the file of jointly covered citations, and used in this analysis.

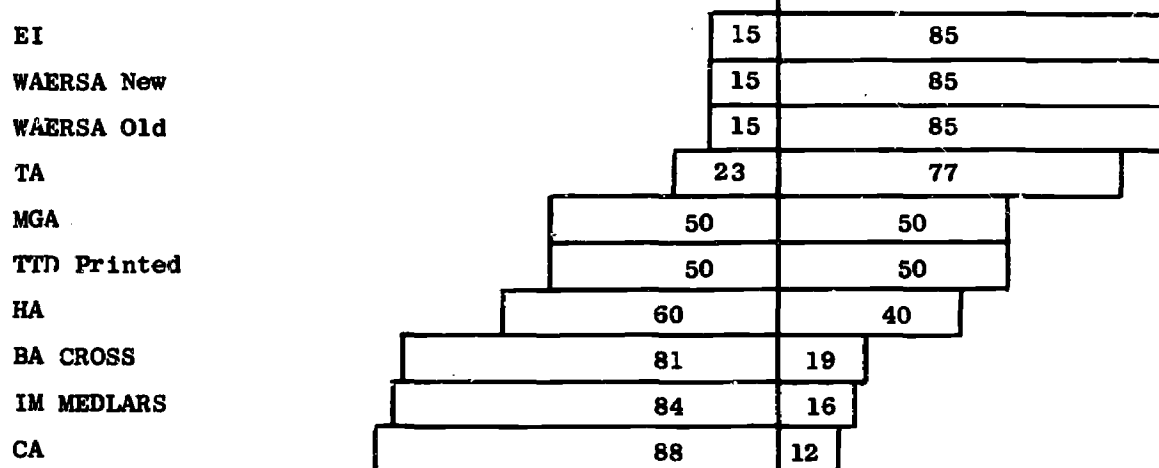
Table XIV (concluded)  
Effect of Sample Size on Determination of Value of Index Term Relationships Observed in  
Citations Indexed Jointly by B of A and Other Services That Use Hierarchical or Multiple Term Index Entries



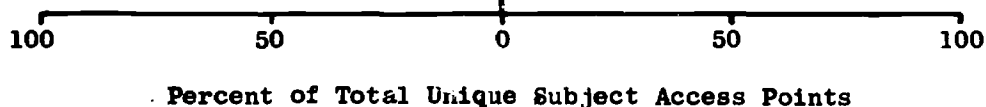
#### Single Term Indexes



#### Multiple Term Indexes, Single Subject Access Point Studied\*



#### Multiple Term Indexes, Total Subject Access Points Studied



\* Incomplete data since only one access point was studied for each of these services.

Fig. 13

Percent of Total Unique Subject Access Points Provided  
by B of A and 13 Other Services



Service	Number of Citations in Sample Indexed by		Terms Assigned by B of A to these Citations				Terms Assigned by the Other Service to these Citations				Total Number of Unique Subject Access Points Provided by		Percent of Total Unique Subject Access Points that are Provided by:
	Both B of A and Other Service		Total Number	Number of Whole Terms that are Unique Subjects		Total Unique Terms and Entries Provided by B of A	Total Number	Number of Whole Terms that are Unique Subjects		Total Unique Terms and Entries Provided by the Other Service	B of A	Other Service	
	B of A	Other Service		Number of Whole Terms that are Unique Subjects	Number of Whole Terms that are Unique Subjects			Number of Whole Terms that are Unique Subjects	Number of Whole Terms that are Unique Subjects				
BA 3.A.S.1.C.	20												
Bussystematic	20		65	4 (6.1) <sup>2</sup>	5 (7.7)	9 (13.8)	146	40 (27.4)	dna	40 (27.4)	49	18.1	81.6
CHUSS	20		65	7 (10.8)	19 (29.2)	26 (40.0)	34	12 (35.2)	dna	12 (35.2)	32	66.1	31.6
IAI	20		65	4 (6.2)	9 (13.8)	13 (20.0)	117	30 (25.6)	27 (23.1)	57 (48.7)	70	18.6	81.4
CA	20		56	19 (33.9)	9 (16.1)	28 (50.0)	204	—	—	—	28	100.0	—
CA	20		54	—	4 (7.4)	4 (7.4)	86	6 (7.0)	24 (27.9)	30 (34.9)	34	11.8	88.2
DSA	20		53	7 (13.2)	10 (18.9)	17 (32.1)	65	14 (21.5)	dna	14 (21.5)	31	54.8	45.2
EI	29		59	5 (8.5)	12 (20.3)	17 (28.8)	29	3 (10.3)	—	3 (10.3)	20	85.0	15.0
IA			Index terms unavailable for this study										
IA	25		78	1 (1.3)	5 (6.4)	6 (7.7)	109	4 (3.7)	5 (2.6)	9 (5.3)	15	40.0	60.0
IV	20		56	2 (3.6)	6 (10.7)	8 (14.3)	124	39 (31.5)	2 (1.6)	41 (33.1)	49	16.3	83.7
IV			Index terms unavailable for this study										
IGA	5		14	1 (7.1)	—	1 (7.1)	13	4 (30.8)	1 (7.7)	5 (38.5)	10	50.0	50.0
IPALS	20		218	4 (26.6)	26 (11.9)	29 (13.3)	348	97 (28.1)	dna	97 (28.1)	123	21.1	78.9
IPALS	16		47	2 (9.7)	—	2 (9.7)	4	—	4 (25.0)	4 (25.0)	6	33.3	66.7
ITPD Printed	20		47	2 (4.3)	4 (8.5)	10 (21.3)	38	10 (26.3)	10 (26.3)	10 (26.3)	20	50.0	50.0
Computer	20		47	1 (2.1)	4 (8.5)	5 (10.6)	198	121 (61.1)	3 (1.5)	124 (62.6)	126	1.0	99.0
TA	20		45	6 (7.8)	11 (14.2)	17 (22.0)	52	3 (5.8)	2 (3.8)	5 (9.6)	26	77.3	22.7
WABUSA New	20		45	1 (2.2)	16 (35.5)	17 (37.7)	20	—	3 (1.5)	3 (1.5)	20	85.0	15.0
WABUSA Old	20		45	1 (2.2)	16 (35.5)	17 (37.7)	20	—	3 (1.5)	3 (1.5)	20	85.0	15.0

points (88.2 percent). Of these a large number were chemical compounds. Three services of this type provided a smaller percentage of unique terms than B of A: EI (15 percent), WAERSA (15 percent) and TA (22.7 percent). Five other services covered a range from 84 percent to 50 percent. Two services, BAI and PAIS, also provided multiple term indexing, but should be considered separately, since only the one entry under which a searcher found the citation was available.

Of the services which use single term entries, the largest percent of unique access points was provided by the TTD Computer Index (96 percent), and the least by BA Biosystematic (31.6 percent). The three others (BA, B.A.S.I.C., PDB, and DSA) varied from 82 percent to 45 percent.

#### IV. RELATIONSHIP OF B OF A SUBJECT LIST TO TERMS APPLIED BY OTHER SERVICES

In addition to comparing the index terms that were actually applied jointly to individual documents by B of A and other services, a study was also made of the extent to which all of the terms used by the other services on the jointly covered documents were also included in the B of A list of subject headings, as represented by the B of A 1967 annual subject index (see sample page in Fig. 14). The objective of this effort was to obtain another, and independent, measure of the degree of association between the indexing of B of A and other services. This measure represents the degree of potential match, and is less sensitive to the frequency of use of a term by each of the services. The working data for this part of the study consisted of an alphabetically arranged computer listing of the index terms used by each of the other services for indexing the sample documents covered by B of A. A sample page from such a computer listing was shown in Fig. 6.

As with the study of comparative indexing that was done on a citation-by-citation basis, a number of types of relationships could be defined for the match between the other services' terms and the terms in the B of A authority list. However, because of the large number of possible matches in the authority list, it would have been too difficult to apply exactly the same set of relationships. For this reason, this analysis effort was restricted to determining only the number of Class I relationships described earlier (i.e., same alphabetic entry, with allowable variations) that existed between the terms assigned by the other services and the terms on the B of A list.

This analysis was done by checking to see whether each of the other service's terms had a Class I relationship to a term in the B of A annual index. If it had such a relationship, then a note was made to indicate: (1) whether the whole term, as used by the other service, appeared in B of A; or (2) whether just the entry word was alphabetically the same in both B of A and the other service; or (3) whether B of A had only a see reference under that entry term. The variations allowed in assigning alphabetic identity were the same as those used in comparing index terms assigned by two services to the same document (see Table X)

Data for this comparison are illustrated in Fig. 15 and summarized in Table XVI, and show that a large percentage (48 to 93 percent) of the index terms actually used by the other services on the sample B of A citations are already included in the B of A subject authority list.

ITEM

SUBJECT INDEX

ITEM

V. L. 1

ITEM

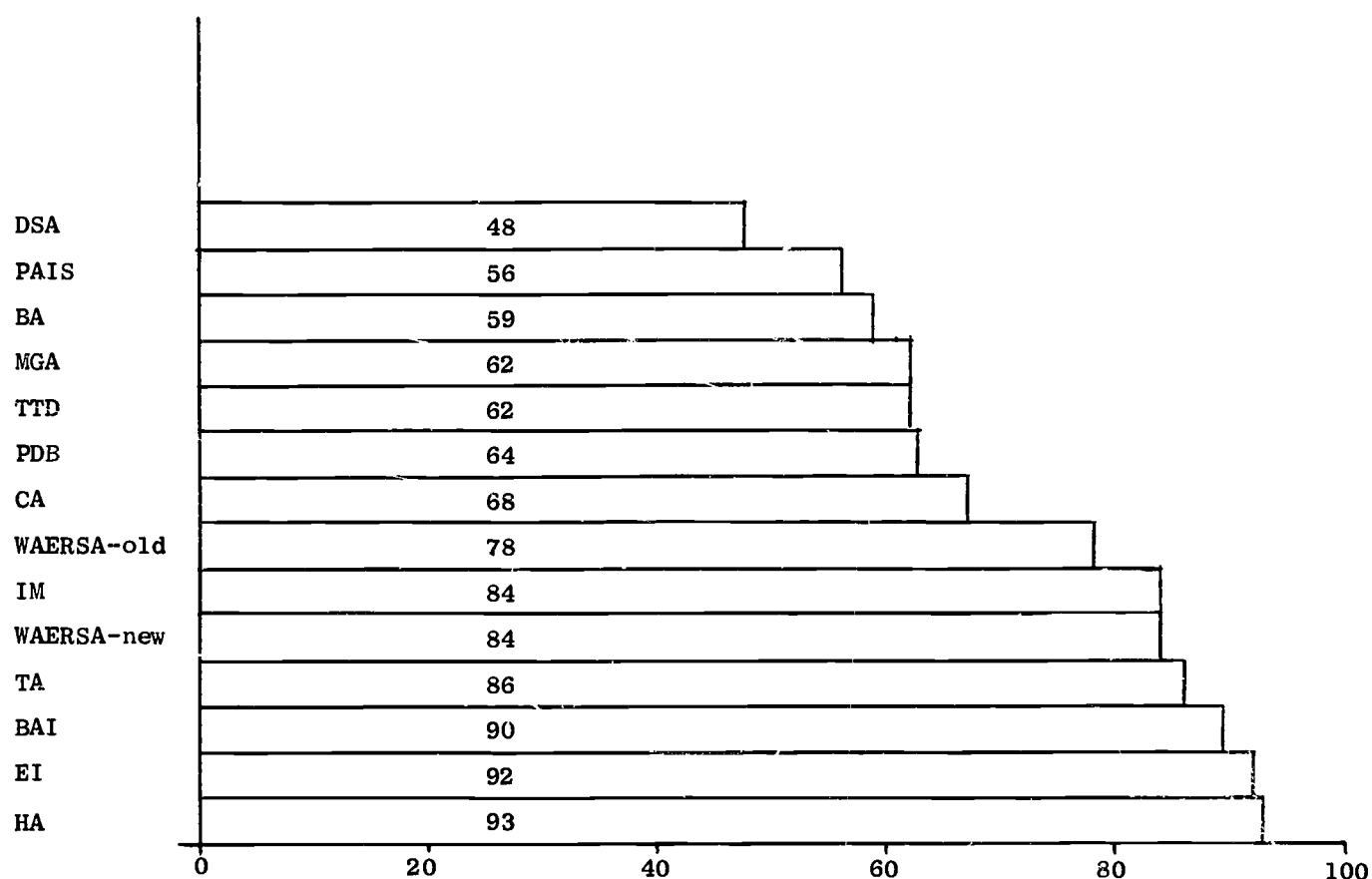
A-1114 SEE PROMETRYNE		ABIES BALSAMEA--CONT		ABORTION CATTLE CAUSES--CONT	
ABACARUS	22199	BARK	32220	74528*	8525*
ABACUS (N G)	46743*	BIOCHEMISTRY	61539	86025*	7454*
ABANDONED LAND		CHEMISTRY	38081	85880*	74547*
GREAT BRITAIN		CONES	69237		
HUNGARY	72608	FUNGUS DISEASES	8621**		
NEW ZEALAND	82892*	ANTICOSTI ISLAND	70624**		
ABATE	31298	LAKE STATES	9205**		
FORMULATIONS		MEASUREMENT	68779		
MOSQUITO CONTROL	22529	PESTS	38088**		
55107	47003	C/NADA	22615		
62016	68339	OUTBREAKS			
TOXICITY		CANADA			
AQUATIC LIFE	47152	SURVEYS	5425		
ABATTOIRS	55107	NORTHEASTERN STATES	38735		
SEE	84659*	WEED CONTROL	88257		
SLAUGHTERHOUSES		CHEMICAL	80831		
ABDERHALDEN'S REACTION	28858*	ABIES CEPHALONICA	68772*		
ADDOMEN		GROWTH	5413*		
APHELINUS SEMIFLAVUS	68123*	PESTS	68772*		
APIS MELLIFERA	38947*	GREECE	68772*		
ASSES	45044	MOOD	68772*		
ATTA CEPHALOTES	46476	ABIES CONCOLOR	68772*		
BLATTELLA GERMANICA	4710	BIOCHEMISTRY	68772*		
BUFFALOES	28634	PLANT PARASITES	68772*		
CATS	60481	ABIES FRASEKI	68772*		
CATTLE	28760	ANATOMY	68772*		
CHINCHILLAS	2754	CUTTING SYSTEMS	68772*		
COLEOPTERA	67255	PESTS	68772*		
DOGS	26780	NORTH CAROLINA	68772*		
DISEASES	67224	ABIES GRANDIS	68772*		
DROSOPHILA MELANOGASTER	30156	CULTURE	68772*		
HORSES		BELGIUM	68772*		
LEUCOPHAEA MAERAE	36822	ECOLOG	68772*		
MECROSCIA SPARAXES	746557	BELGIUM	68772*		
PAPILLO DEMOLEUS	46570	GERMINATION	68772*		
PERIPLANETA AMERICANA	46534	PESTS	68772*		
61645	13884	CANADA	68772*		
61653*		OREGON	68772*		
22112/		SEEDLINGS	68772*		
PHAENACANTHA AUSTRALIS	30215	CZECHOSLOVAKIA	68772*		
POGONOMYRMEX OCCIDENTALIS	46476	SEEDS	68772*		
RABBITS	54135*	STORAGE	68772*		
RHODONCHUS PROLIXUS	13763	TREATMENT	68772*		
HELMINTHUS SEE		VIABILITY	68772*		
HIBISCUS		WASHINGTON	68772*		
ABERPTINAE (N SPAN)	22201	WOOD	68772*		
ABGLIDOPHAGNA (N G)	17002	ABIES LASIOCARPA	68772*		
ABGLIDOPHAGNA SETOSUM	17002	ALASKA	68772*		
ABGRALLASPIS	30495	ANATOMY	68772*		
ABIES		BREEDING	68772*		
BULGARIA	6017*	COLORADO	68772*		
CONES	39380	DISEASE RESISTANCE	68772*		
CULTURE		ECOLOG	68772*		
CZECHOSLOVAKIA	31246*	FUNGUS DISEASES	68772*		
USSR	89161*	PESTS	68772*		
ECOLOG	89477*	CANADA	68772*		
GROWTH	65866*	SITES	68772*		
HARVESTING	88928*	ABIES MAGNIFICA	68772*		
HISTORY	8835*	PLANT PARASITES	68772*		
IDENTIFICATION	25191	ABIES MAGNIFICA SHASTENSIS	68772*		
INJURIES	22956*	BREEDING	68772*		
63930*	5922**	DENMARK	68772*		
LATIN AMERICA		HUNGARY	68772*		
MEASUREMENT	7636	TAXONOMY	68772*		
PEST CONTROL	6017*	WOOD	68772*		
BIOLOGICAL		ABIES PROCERA	68772*		
CANADA	47205	BREEDING	68772*		
CHEMICAL	62076	DENMARK	68772*		
PENNSYLVANIA	30695**	WASHINGTON	68772*		
YUGOSLAVIA	88282*	ABIES SACHALINENSIS	68772*		
PESTS		GROWTH	68772*		
PACIFIC NORTHWEST	38109**	INJURIES	68772*		
POLAND	47203*	SEEDLINGS	68772*		
PHYSIOLOGY	49866*	SEEDS	68772*		
PULPWOOD	39294	ABIETIC ACID	68772*		
SEEDLINGS	89176*	ABLAUTUS	68772*		
USSR	25191	ABONASAL FISTULA	68772*		
YIELDS	88928*	CATTLE	68772*		
USSR	68757*	SHEEP	68772*		
ABIES ALBA		ABONASAL HERNIA	68772*		
ABNORMALITIES	55803*	CATTLE	68772*		
CULTURE		ABONASAL TORSION	68772*		
ITALY	47929*	CATTLE	68772*		
ECOLOG	629**	ABONASUM	68772*		
POLAND	761	CATTLE	68772*		
INJURIES	474	ABONASUM	68772*		
PEST CONTROL		ABONASUM	68772*		
BIOLOGICAL		CATTLE	68772*		
PESTS	38*	ABONASUM	68772*		
HIMALAYAS	88*	ABONASUM	68772*		
POLAND	38*	ABONASUM	68772*		
WOOD	76*	ABONASUM	68772*		
ABIES AMABILIS	471	ABONASUM	68772*		
PESTS		ABONASUM	68772*		
CANADA	141	ABONASUM	68772*		
ABIES BALSAMEA		ABONASUM	68772*		
ABNORMALITIES	69237	ABONASUM	68772*		
ANATOMY	6677	ABONASUM	68772*		

Fig. 14

Sample Page from 1967 B of A  
Subject Index

TEXT OF THIS REFERENCE IS NOT IN ENGLISH.

\*\*REFERS TO PUBLICATION OF U.S.D.A.,  
STATE AGRICULTURE EXPERIMENT STATION  
OR EXTENSION SERVICE.A1 INDEXED FROM ABSTRACT JOURNAL.  
FULL TEXT OF ORIGINAL MAY NOT BE  
AVAILABLE.



Percent of Total Number of Different Terms Supplied  
by This Service That Had the Same Alphabetic  
Entry Term as Those in the B of A Subject List

Fig. 15

Percent of Other Services' Index Terms in B of A Subject Index

Service	Number of Citations Indexed Jointly With B of A	Total Number of Different Terms Supplied by This Service for the Citations in This Sample	Number of Terms			Percent of Total Number of Different Terms Supplied by This Service That Were the Same Alphabetical Entry as Those in the B of A Subject List
			Alphabetically Identical to Terms in B of A Subject List	With Same Entry Word Only as a Term Used by B of A	With Same Entry as a See Reference Used by B of A	
BA**	752					
B.A.S.I.C.		4,140	1,898	197	304	57.9
Biosystematic		437	203	84	8	67.5
Total		4,577	2,101	281	312	58.9
BAI	378	378	160	139	40	89.7
CA	591	3,188	191	1,842	119	67.5
DSA	72	216	87	14	2	47.7
EI	29	26	8	14	2	92.3
FA	Index terms unavailable for this study					
HA	138	521	70	358	55	92.7
IM	306					
IM	768		179	410	65	85.2
MEDLARS (terms added to IM terms)	499		139	226	44	82.0
Total	1,267		318	636	109	83.9
IV	Index terms unavailable for this study					
MGA	5	13	1	5	2	61.5
PDB	897	3,336	1,655	197	262	63.6
PAIS	16	16	2	5	2	56.3
TTD	33					
Printed	53		0	36	2	71.7
Computer	191		63	50	1	59.7
Total	244		63	86	3	62.3
TA	27	66	6	43	8	86.4
WAERSA Old	79	83	9	49	7	78.2
WAERSA New	79	83	9	54	7	84.3

\* With allowable variations of the type listed in Table X

\*\* The CROSS Index of Biological Abstracts was not examined by this procedure because the terms supplied by BA were abbreviated and a complete list of the abbreviations used was not available

Table XVI

Relationships Observed in a Comparison of the 1967 B of A Subject Index with the Index Terms Supplied by the Other Services

In contrast to the findings described in earlier sections, i.e., that a relatively small percent of terms assigned to the same citations by B of A and one other service had the same alphabetical entry with allowable variations, this analysis revealed a much higher percentage of terms with the same alphabetical entry. This indicates that there is a high degree of overlap in the vocabulary used by B of A and other services, even though the choice of terms for a given citation may differ considerably.

It should be noted that this count was based on alphabetical relationships rather than subject relationships or application of a term to a particular article. The same word or term might be common to both B of A and another service but have an entirely different meaning in each index. For example, the terms "slashers" and "slashing" used by TTD were judged to have a Class I relationship with the term "slash" as used by B of A. However, B of A's use of "slash" was as a forestry term, and the articles indexed by B of A under this term had no relation to "slash" used by TTD to index textile processing. This factor would work to discount somewhat the degree of actual commonality of the word lists.

## V. RELATIONSHIP OF B OF A TERMS TO TITLE WORDS

Several prior studies have investigated the extent to which terms taken from the document title are related to terms that were or would have been supplied by manual indexing, with or without an indexing authority list.\* Several of the services participating in this study (PDB, BA) made extensive use of title word indexing. It was of interest to this study to determine the relationship of present B of A indexing to possible title word indexing.

### A. PROCEDURE

It was assumed that title words were incorporated or reflected to some extent in the B of A indexing. In order to determine the extent of this inclusion, two uniform random samples of one hundred citations each were taken from a computer listing, in citation number order, of all index terms applied by N.I.L. to the citations appearing in the 1967 B of A (see Fig. 16). The first sample of 100 consisted of every 1000th citation from this serial numbered list, beginning with citation number 1000, plus every 15,000th citation, beginning with citation number 15,001. The second sample of 100 consisted of every 1000th citation beginning with citation number 500, plus every 15,000th citation beginning with citation number 15,501.

The number of unique words in the set of B of A index terms for each citation and the number of these B of A index terms which also appeared in the title of each citation were counted. These results are summarized in Table XVII, broken into sample groups of fifty in order to show the consistency of results with increasing sample size.

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\* J. O'Connor, "Correlation of Indexing Headings and Title Words in Three Medical Indexing Systems." American Documentation, v. 15, no. 2, April 1964, p. 96.

J. P. Knable II, "An Experiment Comparing Keywords Found in Indexes and Abstracts Prepared by Humans with Those in Titles." American Documentation, v. 16, no. 2, April 1965, pp. 123-124.



LISTING OF SUBJECT INDEX  
1967

UNIQUE NUMBER	CITATION NUMBER	LANG CODE	GEUG CODE	S U B J E C T I N D E X
67600055	000001	0	3	ECONOMY POLICIES THAILAND
67600056	000002	1	2	ECONOMIC CONDITIONS NICARAGUA
67600057	000003	1	0	ECONOMIC CONDITIONS
67600058	000003	1	2	ECONOMIC CONDITIONS GUATEMALA
67600059	000004	0	2	ECONOMIC CONDITIONS ISRAEL
67600100	000005	1	2	ECONOMIC CONDITIONS SPAIN
67600101	000005	1	2	TRADE SPAIN
67600102	000006	0	3	INDUSTRY AND AGRICULTURE GREAT BRITAIN
67600103	000007	0	0	ECONOMIC GROWTH
67600104	000007	0	0	BIBLIOGRAPHIES ECONOMIC GROWTH
67600106	000007	0	0	BIBLIOGRAPHIES ECONOMIC HISTORY
67600107	000008	1	2	ECONOMIC GROWTH ITALY
67600108	000009	0	2	ECONOMY LATIN AMERICA
67600109	000009	0	2	TRADE LATIN AMERICA
67600110	000009	0	2	GEOGRAPHY LATIN AMERICA
67600111	000010	1	3	ECONOMY POLICIES HONDURAS
67600112	000010	1	2	SOCIAL CONDITIONS HONDURAS
67600113	000011	0	0	ECONOMICS RESEARCH METHODS
67600114	000012	1	2	ECONOMIC CONDITIONS RUMANIA
67600115	000012	1	2	SOCIAL CONDITIONS RUMANIA
67600116	000012	1	2	POLITICS RUMANIA
67600117	000013	2	0	ECONOMICS BIBLIOGRAPHIES
67600118	000013	2	0	BIBLIOGRAPHIES ECONOMICS
67600119	000014	1	2	ECONOMY USSR
67600120	000015	0	0	ECONOMIC GROWTH
67600121	000016	0	2	AGRI-BUSINESS DEVELOPING AREAS
67600122	000017	1	0	ECONOMICS RESEARCH METHODS STATISTICAL
67600123	000017	1	0	ACCOUNTING
67600124	000017	1	0	BIBLIOGRAPHIES ACCOUNTING
67600125	000017	1	0	BIBLIOGRAPHIES ECONOMIC RESEARCH METHODS
67600126	000018	0	0	ECONOMY POLICIES
67600127	000019	1	2	ECONOMIC CONDITIONS AFRICA
67600128	000019	1	2	SOCIAL CONDITIONS ASIA
67600129	000019	1	2	ECONOMIC CONDITIONS ASIA
67600130	000019	1	2	SOCIAL CONDITIONS AFRICA
67600131	000019	1	3	LAND REFORM ASIA
67600132	000019	1	3	LAND REFORM AFRICA
67600133	000020	0	2	ECONOMIC CONDITIONS ISRAEL
67600134	000021	0	2	ECONOMIC CONDITIONS JAMAICA
67600135	000022	1	2	POLICIES SWITZERLAND
67600136	000022	1	2	ECONOMY SWITZERLAND
67600137	000023	1	2	ECONOMIC GROWTH GREECE
67600138	000024	1	0	ECONOMICS RESEARCH METHODS STATISTICAL
67600139	000025	1	2	INDUSTRIALIZATION FRANCE
67600140	000026	2	0	SPATIAL RESEARCH BIBLIOGRAPHIES
67600141	000026	2	0	BIBLIOGRAPHIES SPATIAL RESEARCH
67600142	000026	2	0	ECONOMICS RESEARCH METHODS STATISTICAL
67600143	000026	2	0	BIBLIOGRAPHIES ECONOMIC RESEARCH METHODS

Fig. 16

1

Sample Page of B of A Index  
Terms Furnished by NAL  
in Citation Number Sequence

Number of Citations		Total Number of Unique Words in B of A Index Terms Applied to This Sample		Total Number of These Index Words Which Also Appear in Citation Titles in This Sample		Percent of B of A Index Words Applied to This Sample Which Also Appear in Citation Titles in This Sample	
Sample	Cumulative	Sample	Cumulative	Sample	Cumulative	Sample	Cumulative
50		224		99		44.2	
	50		224		99		44.2
50		238		100		42.0	
	100		462		199		43.1
50		279		117		41.9	
	150		741		316		42.6
50		228		94		41.2	
	200		969		410		42.3

Table XVII  
Relationship of B of A Index Words to Citation Titles on  
an Article-by-Article Basis

## B. FINDINGS

The results given in Table XVII indicate that on the average 42 percent of the index term words applied by B of A to a citation also appeared in the titles of the documents being indexed. This suggests that: (1) the titles are descriptive of the subject content of the documents, and (2) the indexing was influenced by title words.

## VI. RELATIONSHIP OF B OF A SECTION HEADINGS TO THOSE USED BY OTHER SERVICES

The primary section headings used by B of A, though printed in alphabetical order, are similar to a classification system. They are general subject categories which cover the whole field of agriculture, regardless of the number of articles which fall within any one category. In B of A an article is listed once, under a general heading, and references are made to it from the applicable specific index terms in the subject index. Although the primary headings are subdivided, they are never very specific. Throughout B of A no heading is more specific than a type of crop or genus of animal or insect.

The rationale for general headings is that the reader approaching via the subject headings is interested in a general approach to a general subject. Grouping articles under the general headings should allow the reader to use B of A as a current awareness tool as well as a reference work. To find very specific information, he would use the index.

It would be useful to the user if, after scanning through the B of A sections, he could also scan the other abstracting and indexing services in a similar manner in order to add to the completeness of coverage of a general subject, preferably by looking under the same subject heading as that used in B of A. Unfortunately, a look at the section headings used by other services for the same B of A citation shows that the reader generally cannot do this. The subject headings used by the 15 other services studied here are generally unlike those used by B of A or by each other. This observation is based upon an examination of the printed section headings used by those services for the B of A citations that they covered. This observation was facilitated by a summary printout of section headings for the overlapped citations, as shown in Fig. 17.

The differences in the headings are not due solely to the simple substitution of synonyms, but rather to differing degrees of specificity in indexing and the different points of view of the indexes. Furthermore, each of the services is different enough so that learning the vocabulary of one does not help much in predicting what to look under in another. The following citation should serve as an introductory example:

PAGE NO. 61

22 NOV 1968

## COMPARISON OF SECTION HEADINGS USED BY B OF A AND BY OTHER SERVICES FOR THE SAME CITATION

## B OF A SECTION HEADING AGRICULTURAL PRODUCTS - DAIRY PRODUCTS - ANALYSIS AND COMPOSITION

B OF A REFERENCE NUMBER 1878

J. DAIRY SCI. 49(11), 1462-1463.

J. DAIRY SCI. 49(11), 1462-1463.

FOOD TECHNOLOGY - DAIRY PRODUCTS

CHROMATOGRAPHIC ANALYSIS

FOODS

CHEMISTRY AND PHYSICS - ANALYSIS

B OF A SECTION HEADING

B OF A SECTION HEADING

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Fig. 17

Sample Page of Summary  
 Printout of Printed Section  
 Headings Used by Other Services  
 for B of A Citations

B of A Citation Number: 86820

Title: Hormonal control of reproduction in  
lactating and non-lactating anestrous  
ewes.

B of A heading: Animal industry - sheep and  
goats - breeds and breeding

BA heading: Pharmacology - general -  
reproductive system

BAI heading: Lactation

CA heading: Hormones

DSA heading: Physiology - general

As a first set of specific and illustrative examples, Table XVIII lists the section headings used by three other services (BA, CA, DSA) for eight citations from the B of A section heading: Agricultural Products - Dairy Products - Analysis and Composition. DSA, which is specifically concerned with this field, put the same eight citations under six different headings. CA and BA employ broad headings in the same manner as B of A, but CA used four different headings for seven of these citations, and BA used three different headings for six of these citations.

A second set of examples is given in Table XIX, in which seven citations from various B of A sections on veterinary medicine are given with the corresponding section headings from four other services (BA, BAI, CA, DSA). A third set of examples is given by the three unrelated citations in Table XX. It should be noted that BAI probably included most of these citations under other section headings in addition to those shown in Tables XVIII-XX; however, only one heading was picked up in this study.

With all of the services examined, one point was clear: almost the entire contents of any of the other services would have to be scanned in order to find a significant fraction of the subject coverage of any group of citations under a given B of A section heading.

<u>B of A Citation Number and Title</u>	<u>BA Section Heading</u>	<u>CA Section Heading</u>	<u>DSA Section Heading</u>
1200: Acetaldehyde utilization by Leuconostoc species	Food and industrial microbiology - miscellaneous	Microbial biochemistry	Bacteriology and mycology - general
11040: Distribution of lipase among components of a water extract of rennet casein		Foods	Chemistry and physics - general
18720: A comparison between hot-wire laboratory apparatus and a plate heat exchanger for determining the sensitivity of milk to deposit formation	Food technology - dairy products		Chemistry and physics - processing and manufacture
18740: Calcium, protein, fat and moisture of commercially made cottage cheese	Food technology - dairy products	Foods	Chemistry and physics - milk and milk products
18760: Gas-liquid chromatographic analysis of milk fat, rapid preparation of butyl esters	Food technology - dairy products	Foods	Chemistry and physics - analysis
43180: Changes in milk proteins treated with hydrogen peroxide	Food technology - dairy products	General biochemistry	Chemistry and physics - general
65800: The isolation and identification of the B protein of lactose synthetase as alpha-lactalbumin	Enzymes - chemical and physical studies	Enzymes	Chemistry and physics - general
83783: Increasing protein content of whey		Foods	Technology - various products

Note: The B of A section heading for all eight citations was: Agricultural Products - dairy products - analysis and composition

Table XVIII

Section Headings Used by B of A and Three Other Services for the Same Citations in the Field of Agricultural Products

<u>B of A Citation Number and Title</u>	<u>B of A Section Heading</u>	<u>EA Section Heading</u>	<u>BAI Section Heading</u>	<u>CA Section Heading</u>	<u>DSA Section Heading</u>
28040: Studies on foot and mouth disease virus ribonucleic acid synthesis	Animal industry - veterinary medicine	Virology, general - animal host viruses	Foot and mouth disease	Mammalian pathological biochemistry	
44240: Separation of infections and autointerfering particles in vesicular stomatitis virus preparations	Animal industry - veterinary medicine	Medical microbiology - pathogenic viruses	Stomatitis, vesicular, virus	Microbial biochemistry	
2800: Histochemical observations on Mycoplasma after staining with acridine orange	Animal industry - cattle - veterinary medicine	Clinical microbiological methods - general	Mycoplasma	Microbial biochemistry	
28540: Studies of bovine mastitis; histochemical observations on the streak-causal epithelium	Animal industry - cattle - veterinary medicine	Veterinary science - microbiology	Cows - diseases and pests		Bacteriology and mycology - animal diseases
36600: Correlation between California mastitis and Wisconsin mastitis test reagents as used in the Wisconsin mastitis test	Animal industry - cattle - veterinary medicine	Veterinary science - microbiology	Mastitis tests		Bacteriology and mycology - analysis
44680: Anthelmintic activity of two organic phosphorous compounds, coumaphos and naphthalophos, against gastrointestinal nematodes of cattle	Animal industry - cattle - veterinary medicine	Chemotherapy - antiparasitic agents	Coumaphos	Pesticides	
37200: Microspectrophotometry of deoxyribonucleic acid in Shope papilloma and derived carcinoma	Animal industry - rabbits - veterinary medicine	Neoplasms - general; methods	Papilloma virus	Mammalian pathological biochemistry	

Table XIX

Section Headings Used by B of A and Four Other Services for the Same Citations in the Field of Veterinary Medicine



<u>B of A Citation Number and Title</u>	<u>B of A Section Heading</u>	<u>BA Section Heading</u>	<u>BAI Section Heading</u>	<u>CA Section Heading</u>	<u>TA Section Heading</u>
20800: Effects of dietary modifications on response of the duckling to aflatoxin	Animal industry - poultry - feeds and feeding	Toxicology, general - food residues, additives and preservatives	Aflatoxins	Animal nutrition	
30660: Electron microscopy of tick-borne fever agent in bovine and ovine phagocytizing leukocytes	Entomology - insect control - pests of animals and man	Veterinary science - microbiology	Tick-borne fever agent	Microbial biochemistry	
57480: In situ breakage of turnip yellow mosaic virus RNA and in situ aggregation of the fragments	Plant science - plant pathology and protection - virus diseases - horticultural crops	Virology, general - plant host viruses	Turnip yellow mosaic virus	Microbial biochemistry	Diseases - virus

Table XX

Section Headings Used by B of A and Four Other Services for the Same Citations in Several Subject Fields

## VII. SUMMARY

1. There is wide variation in the numbers and combinations of data elements used in the printed citations of each service. Of 38 identifiable data elements found in printed citations in the services studied, B of A employed 25, compared to an average of 23 for all the services. Six data elements were found to be common to all. Data elements used by more than half of the other services but not by B of A included corporate author location, cross reference to related citation, and price.
2. Format and typography varied considerably among all of the printed indexes. Author indexes were fairly consistent in giving author surname and initials, and citation number. Subject indexes were also fairly consistent in yielding only a citation number.
3. A majority of the services provided an annual subject index and/or an annual cumulation of the citations, although specific patterns of cumulation varied. Only two services had no annual indexes or other cumulations.
4. B of A was the only service providing a separate organization index. Other services provided other types of specialty indexes, such as the geographic indexes of FA, MGA, and WAERSA, and other special features such as review articles.
5. For the same source material, six of eleven comparable services provided substantially more subject access points per citation than B of A did; two services provided more than four times as many subject access points as B of A.
6. When comparing the index terms actually provided by each of the other services and by B of A for the same citations, an average (for single term, and for multiple or hierarchical term services, respectively) of:

- 10-13 percent of term pairs had the same alphabetic entries
- 46-66 percent of term pairs were the same or related concepts
- 52-30 percent of term pairs were unrelated in concept.

Less than one percent of the term-pairs were entirely alphabetically identical.

7. Where there were differences in indexing information applied to the same citation, the other services, rather than B of A, generally provided the additional or unique subject access points.

8. A large percentage (48 to 93 percent, depending upon the service) of the index terms actually used by the other services on the sample B of A citations had the same alphabetic entry as a word in the B of A subject index for 1967. This is in contrast to the relatively small percent of term-pairs with the same alphabetic entry, as identified in the article-by-article comparison.

9. On an article-by-article basis, approximately 42 percent of the index term words assigned by B of A to an article coincide with words in the title.

10. On an article-by-article basis, there is very little agreement or commonality in the printed section headings used by these services for the same citations.

In addition to the above substantive findings, this study effort was also successful in developing and extending the measurement and evaluation techniques applicable to this type of examination. A considerable amount of useful source data was also compiled in a computer data base in a form suitable for further detailed investigation.

The following generalizations with regard to B of A can be made on the basis of the specific findings noted above:

In thinking of merging or matching the B of A terms with the index terms contributed by other services, NAL should recognize the difficulty of making such matches simply on the basis of an alphabetic match of lists of items, as might be done with a computer program. Even if all of the exception routines corresponding to Table X were included in this program, less than one percent of the terms could be identified as completely redundant and removed in this manner. Approximately ten percent could be identified as having the same entry word, but terms following the entry would not match.

A considerable amount of unique indexing information is provided by each of the services. For this complex of secondary services, this would seem to be an argument in favor of duplicate coverage and processing of the same material by more than one service.